

CANADA MORTGAGE AND HOUSING CORPORATION

RESEARCH ON AN IMPROVED MEASURE OF AFFORDABILITY FOR ESTIMATING HOUSING NEED IN CANADA

HOUSING AFFORDABILITY AND FINANCE

Research Report



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***Research on an Improved Measure
of Affordability for Estimating
Housing Need in Canada***

March, 1997

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This legislation is designed to aid in the improvement of housing and living conditions in Canada. As a result, the Corporation has interests in all aspects of housing and urban growth and development.

Under Part IX of this Act, the Government of Canada provides funds to CMHC to conduct research into the social, economic and technical aspects of housing and related fields, and to undertake the publishing and distribution of the results of this research. CMHC therefore has a statutory responsibility to make available information which may be useful in the improvement of housing and living conditions.

This publication is one of the many items of information published by CMHC with the assistance of federal funds.

EXECUTIVE SUMMARY

This study was undertaken to assist the Federal/Provincial/Territorial Partners in their review of the standard for housing affordability used in estimating Core Housing Need. Specifically, the report examines whether there is an alternative measure that better approximates housing affordability needs across the country than the current fixed 30-percent Shelter Cost-to-Income Ratio (STIR).

The study was comprised of three major components:

- Examining the fixed 30-percent STIR norm in relation to actual shelter spending patterns;
- Exploring alternative variable-STIR measures which aim to treat households with differing circumstances more equitably than is the case under a fixed STIR; and
- Estimating the number of households in need under the alternative approaches.

The main findings of the study are presented below.

Examining the Fixed 30 Percent STIR Norm in Relation to Actual Shelter Spending Patterns

Based on extensive empirical investigation, it is concluded that:

- The existence of significant variation in average STIRs by household subgroups casts doubt on the application of a fixed-STIR norm and presents convincing reasons for looking at options to the current fixed 30-percent STIR norm used in the Core Housing Need Model;
- There is support for a STIR norm that varies in some way with differences in household characteristics; and
- The choice of a specific STIR norm, whether a fixed STIR or a "base" STIR in a variable STIR (e.g., Steele and Mazikins) is judgemental. It is a question, then, of establishing a norm to reflect what is considered to be acceptable in Canada today.

Exploring Alternative Variable Stir Measures

Two alternative options to the current fixed 30-percent STIR are considered:

- The **direct approach**, which measures housing affordability in terms of shelter costs only in relation to income, has its basis in the empirical analysis undertaken in the initial component of the research.

Under the **direct approach**, two optional household universes are examined: **Method 1A** encompasses all households; and **Method 1B** excludes homeowners without mortgages (since these owners have relatively low shelter outlays compared to other households).

- The **indirect approach**, which looks at household affordability in terms of overall spending on essentials (shelter and non-shelter) in relation to income, has its base in earlier research (including work for CMHC by Boriss Mazikins).

Two concepts of "essentials" are considered: The **narrow concept**, which includes only food, personal taxes and clothing, is used by Statistics Canada for its Low-Income Cut-Offs; and the **broad concept**, which, in addition, includes spending on personal care, household operation, health care and transportation, is the concept used by both Boriss Mazikins and Dallard Runge in previous work for CMHC. The **indirect approach** using the **broad concept** is referred to as **Method 2**.

Estimating the Numbers of Households in Need Under Alternative Approaches

Estimates of household need under two variable STIRs (**Method 1A** and **Method 2**) are calculated and then compared and contrasted with estimates of households in housing need based on the fixed STIR of 30 percent currently in use.

Key highlights include (based on 1991 data):

- The total number of households in core need identified by the direct approach of roughly 1.1 million is only slightly below that of the current 30-percent fixed STIR (roughly 1.2 million households). Under the indirect approach (**Method 2**), the numbers are substantially lower (about 800,000). Regardless of the approach used, however, the absolute number of households in need is still very large;

- The two alternative variable-STIR approaches make relatively little difference to the geographical distribution of need;
- Relative to the present 30-percent fixed STIR, the direct approach alters the profile of need by including a higher proportion of larger households that have somewhat higher incomes; and
- The indirect approach (**Method 2**), being more targeted to renters and the lower-income groups, can be seen as identifying those in the most profound need.

Both the direct and indirect approaches meet all of the key criteria for developing a variable STIR. Specifically, they are:

- Practical;
- Empirically grounded and easily updatable from readily available information;
- Considerate of equity issues;
- Accountable to household needs to meet both housing and other expenditures; and
- Neutral in terms of their consideration of household organization.

Nonetheless, the two alternative approaches presented here differ in the degree to which they meet the various criteria. For example, the direct approach is more sensitive to the household size criterion. On the other hand, the indirect approach better takes into account equity issues and identifies those households most in need.

A final selection of an alternative variable STIR therefore requires balancing the various criteria.

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CHAPTER ONE – INTRODUCTION

This chapter describes the rationale for commissioning this study, the scope of the study and the study approach.

1.1 BACKGROUND

Housing policy in Canada has long been premised on the use of a single indicator of affordability. When a household living in housing below standards must spend more than the affordability norm (a predetermined proportion of its income) to obtain accommodation which is both suitable and adequate to meet its needs, the household is considered to be in Core Housing Need.

Originally, the maximum shelter cost-to-income ratio that a household could afford to pay without spending more than the norm was set at 25 percent. In North America, a range of 20 to 30 percent has historically been regarded as a fair rate of expenditure for housing.¹ According to Lane, the 25-percent ratio had its roots in a rule of thumb used in the eastern seaboard of the United States for mortgage underwriting of one week's wages out of four for housing.² Since 1986, CMHC and the provinces have agreed to use 30 percent to measure affordability for the purpose of defining need for social housing.³

In the end, it is widely recognized that "what constitutes an excessive proportion of income to allocate to housing costs is a judgemental matter..."⁴

Two concerns have emerged with the use of a fixed 30-percent shelter cost-to-income ratio (STIR) as the affordability norm for determining housing need for social housing:

- The present 30-percent ratio may be too low, given what households are currently paying for housing, thus inflating the number of households in housing need; and

- The application of the same STIR ratio to all households may not adequately take into account their differing circumstances.

CMHC has undertaken some exploratory research into the conceptual basis for and implications of utilizing a variable STIR (work by Mazikins and Runge – see Section 2.7 in Chapter Two).

This study is intended to assist the Federal/Provincial/Territorial Partners in their review of the standard for housing affordability used in estimating Core Housing Need. To do so, the report examines whether there is an alternative measure which better approximates housing affordability needs across the country than the current fixed 30-percent STIR.

1.2 SCOPE OF THE STUDY

Following this Introduction, the report contains three chapters, each of which covers one of the major components of the work program:

- Examining the fixed 30-percent STIR norm in relation to actual shelter spending patterns (Chapter Two);
- Exploring alternative STIR measures which aim to treat households with differing circumstances more equitably than is the case under a fixed STIR (Chapter Three); and
- Estimating the number of households in need under the alternative approaches (Chapter Four).

1.3 STUDY APPROACH

The study relies heavily on an examination of existing data sources on household spending patterns and incomes, within a framework that is based on the Core Housing Need Model, and on

the relevant literature (most of which is the result of CMHC-supported research). Key attributes of the approach include:

- The Chapter Two empirical research relies mostly on tabulations from Statistics Canada's 1992 Survey of Family Expenditures (FAMEX).

FAMEX provides information on household and housing characteristics, detailed spending patterns (both shelter and non-shelter), and income by source. Thus, it is logical that it be the primary source for exploring relationships between shelter spending and other variables.

While the FAMEX micro-data base is an excellent tool for examining housing affordability, it has a limitation. FAMEX does not have all the data to allow the delineation of adequacy and suitability measures. This is not a serious deficiency for the current analysis, as "Without doubt, the unaffordability of housing meeting today's standards is the dominant cause of core housing need".

Data from the 1991 Core Housing Need Database confirm that using FAMEX STIR data with no adjustments for households below adequacy or suitability norms is an acceptable approach. Figure 1-1 shows that the average STIRs for households below the adequacy norm (19.7 percent) or below the suitability norm (19.9 percent) are approximately the same as for all households (19.7 percent). This similarity also holds by income quintile and for

households by type (for households below adequacy norm only). For households below the suitability norm there are some types of households with substantially higher and substantially lower average STIRs than households with the same characteristics – these differences could reflect errors due to small household counts in the sample.

- The empirical analyses adopt Core Housing Need conventions to the extent possible.

To ensure as much consistency as possible with previous empirical work, especially estimates of Core Housing Need, conventions defining income, shelter costs and sample households excluded from the analysis in previous work have also been adopted here. Thus, as an illustration, regular mortgage principal repayments by homeowners are included as a component of shelter costs even though in the FAMEX framework

Figure 1-1:
Average Shelter Cost-to-Income Ratio for Households Below Adequacy and Suitability Norms, Canada, 1991

	Below Adequacy Norm	Below Suitability Norm**	All Households
Household Composition			
Households with Heads Under Age 65			
Individual	27.03	17.63 *	25.91
Couple/No Children	17.00	36.18 *	16.97
Couple/1 Child	17.90	18.46 *	17.71
Couple/2 Children	17.40	19.24	17.79
Couple/3+ Children	19.21	18.78	18.82
Single Parent/1 Child	28.34	29.43 *	30.87
Single Parent/2 Children	30.92	12.16 *	32.91
Single Parent/3+ Children	33.16	24.69 *	31.88
Households with Heads Aged 65+			
Individual	18.92	7.34 *	24.08
Couple	13.50	16.59 *	13.94
All Other Households	15.52	19.11	14.83
Households by Income Quintile			
Lowest	33.52	35.52	35.82
Second	20.35	23.22	22.02
Middle	16.35	15.19	17.30
Fourth	15.06	13.69	14.39
Highest	10.34	9.74	10.80
All Households	19.70	19.88	19.74

* Caution: small sample size

** "Individual" households here are households consisting of two or more unattached individuals only since, by definition, one person households cannot be overcrowded.

1. To be adequate, a dwelling must have full bathroom facilities and, according to its residents, require no major repair.

2. To be suitable, a dwelling must have enough bedrooms for the size and make-up of the occupying household, as defined by the National Occupancy Standard.

Source: CMHC 1991 Core Housing Need Database, developed from the Statistics Canada Household Income, Facilities and Equipment (HIFE) and Shelter Cost Survey (SCS) micro-data tape, 1991, enhanced to facilitate calculations for core housing need.

principal repayments are considered to be an investment.

- The work in Chapters Three and Four relies on the 1991 Core Housing Need Database.

The 1991 HIFE micro-data base compiled by Statistics Canada includes information on household and housing characteristics, shelter costs by component, and income by source. This is the primary data base used by CMHC to compile estimates of housing need and is the information source used to formulate and examine the implications of options to the current fixed 30-percent STIR norm.

- The variable STIR builds on the work already undertaken by Mazikins and Runge.

Possible structures for and implications of a variable STIR have been explored in previous work either commissioned by or done within CMHC (Mazikins and Runge). The basic thrust of this work is to assess housing affordability within a framework that considers all spending on essentials (both shelter and non-shelter) and formulate norms which endeavour to treat households with differing characteristics (e.g., age, composition, size) equitably. These studies together with other literature examined are covered in Section 2.7 of Chapter Two.

CHAPTER TWO – EXAMINING THE FIXED 30-PERCENT STIR NORM IN RELATION TO ACTUAL SHELTER SPENDING PATTERNS

This chapter first explores what households across Canada are paying for shelter, both in relation to their incomes and their other spending on essential goods and services (e.g., food, clothing, transportation). It then highlights the findings of a search of the literature dealing with the empirical and policy aspects of shelter costs and incomes for both fixed and variable STIRs. The chapter finishes with a discussion of implications of the findings for the formulation of alternative STIRs, both fixed and variable, which could overcome some of the key shortcomings inherent in the current fixed 30-percent STIR. The formulation and discussion of alternatives is the subject of Chapter Three.

The empirical analysis and the literature review in this chapter are focused on several important questions:

- Is there support for a fixed-STIR norm of 30 percent or, indeed, for a fixed STIR at all?
- To what extent is there support for a STIR norm which varies by key household characteristics including location?
- What implications do the findings have for the formulation of variable-STIR options?

As mentioned previously, the empirical analysis is based on Statistics Canada's 1992 FAMEX micro-data base.

2.1 THE 1992 FAMEX MICRO-DATA BASE

Statistics Canada conducts a survey of a sample of households across Canada to

examine the detailed spending patterns of households with different characteristics and incomes. The resulting micro-data base provides a wealth of information for assessing shelter cost spending patterns in relation to both income and other spending as well as to household characteristics. FAMEX does, however, have its limitations, as noted in Section 1.3. The data base allows for the analysis of the affordability component of housing need only – i.e., the adequacy and suitability dimensions of housing need can only be considered to a very limited degree. More important, though, the relatively small size of the usable sample (7,605 records) limits the extent of cross-tabulations that can be meaningfully done using this data source (the HIFE sample with 41,330 usable records is much better in this regard).

Several adjustments have been made to the total number of households (records) included in the 1992 FAMEX file for the purpose of the analysis here (see Figure 2-1):

Figure 2-1:
1992 FAMEX Households Used in Shelter Cost-to-Income Analysis, Canada

	Sample Households (Households)	Estimated Universe
Total Households in 1992 FAMEX file	9,492	9,804,337
Exclusions:		
Households with more than one economic family	286	310,303
Households with 0 or negative incomes or shelter costs	434	457,265
Households with mortgage principal payments less than 0 or more than \$15,000	391	429,963
Households changing dwelling unit during 1992	1,205	1,244,580
Households with geography masked	118	121,422
Sub-total	2,434	2,563,533
Less allowance for households with more than one exclusion	547	577,431
Total exclusions	1,887	1,986,102
Total usable households in 1992 FAMEX file	7,605	7,818,235

Source: Tabulated from Statistics Canada, 1992 FAMEX

- Households containing more than one economic family

Most of the information on the FAMEX file refers to the primary economic family, so there is no way of pooling the expenditures of everyone living in households with more than one economic family. Excluding households with more than one economic family ensures the purity of the expenditure analysis undertaken.

- Households with zero or negative incomes or shelter costs

Since shelter cost-to-income ratios cannot be calculated on zero or negative values, these households are excluded. Almost all the exclusions are because of zero or negative shelter costs. A zero shelter cost can occur, for example, when an employee receives free housing from an employer.

- Households making negative or very large mortgage principal repayments

FAMEX normally treats mortgage principal repayments as an investment. However, in the calculation of Core Housing Need, regular mortgage principal payments are treated as a shelter expenditure following the convention of the Census of Canada and HIFE. This approach is followed here. Since extraordinary mortgage transactions (e.g., prepaying a large amount of principal or increasing the size of the mortgage debt through refinancing) would distort the shelter cost estimates, households in 1992 with repayments in excess of \$15,000 or with negative mortgage repayments (e.g., going more into debt) are excluded from the analysis.

- Households changing dwelling units during the year

All households who moved in 1992 regardless of their tenure prior to or after the move are excluded from the analysis. This adjustment ensures that the shelter costs examined are for the dwelling households occupied for the full year.

- Households with their geography masked

Because of the small sample size of FAMEX, Statistics Canada makes adjustments to make sure that individual records cannot be identified. Records that did not have the province identified for confidentiality reasons are excluded here because they do not allow for geographic analysis.

All remaining households are included in our analysis,⁶ including households with STIRs exceeding 100 per cent. These households are included since they are reporting income and shelter expenditures for the same year. Thus, the ratios in excess of over 100 percent do not arise because of the mismatch of this year's shelter

Figure 2-2: Average Share of Aggregate Household Income Spent on Shelter in Canada

	Spending Units*			Households	
	1978	1982	1986	1986	1992
	(Percent)				
Lowest Quintile	28.9	30.5	33.0	32.7	36.3
Second Quintile	18.9	20.0	21.4	21.2	23.8
Middle Quintile	16.3	16.4	16.5	16.5	18.4
Fourth Quintile	13.9	14.5	13.9	13.9	15.1
Highest Quintile	10.8	11.1	10.0	10.0	11.5

* Historically, FAMEX released data on "spending units" which is not quite the same as "households"; 1986 provides a link between estimates based on spending units and estimates based on households

Source: John Engeland, *Canadians and Their Housing Expenditures 1978-1992*, CMHC, October, 1994 (Table 3)

Figure 2-3:
Average Proportion of Aggregate Household Income Spent on Shelter by Income Quintile, Canada

	Spending Units*			Households	
	1978	1982	1986	1986	1992
	(Percent)				
Lowest Quintile	28.9	30.5	33.0	32.7	36.3
Second Quintile	18.9	20.0	21.4	21.2	23.8
Middle Quintile	16.3	16.4	16.5	16.5	18.4
Fourth Quintile	13.9	14.5	13.9	13.9	15.1
Highest Quintile	10.8	11.1	10.0	10.0	11.5

* Historically, FAMEX released data on "spending units" which is not quite the same as "households"; 1986 provides a link between estimates based on spending units and estimates based on households

Source: John Engeland, *Canadians and Their Housing Expenditures 1978-1992*, CMHC, October, 1994 (Table 3)

expenditures against last year's income, as can happen with other data bases like HIFE.

A total of 1,887 records out of the total of 9,492 records on the 1992 FAMEX file have been excluded for purposes of the analysis in this study, leaving usable 7,605 records.

2.2 OVERALL SHELTER COST-TO-INCOME RATIOS IN CANADA, 1978-1992

This section reviews shelter cost-to-income ratios for Canada over the 1978-1992 period as background to a closer look at STIRs by household characteristics in 1992. The statistics highlighted are taken from a CMHC publication released in 1994.⁷ Shelter costs include expenditures on rents and utilities for renters and mortgage interest as well as regular principal payments, property taxes, utilities, insurance premiums, and maintenance/repairs for owners.

2.2.1 All Households

For most of the 1978-1992 period, the average proportion of aggregate Canadian pre-tax household income devoted to shelter expenditures was between 14.6 and 15 percent (see Figure 2-2). The exception was in 1992 when the average climbed to 16.3 percent.

The 1992 experience may have been due to a combination of reduced annual income, because of the recession, and higher mortgage interest payments for owners renewing mortgages at the high rates prevailing in the early 1990s. It is interesting to note that the average ratio in 1982 (a time of economic weakness) was also higher than in 1978. Thus, it appears that the average shelter cost-to-income ratios of Canadians are sensitive

to underlying economic circumstances, which is not surprising.

2.2.2 Households by Income Quintile

The proportion of aggregate household income spent on shelter increased in all five income quintiles between 1978 and 1992, though the increase was less in the higher quintiles than the lower quintiles (see Figure 2-3). For the three lowest quintiles, the increases occurred throughout the 14-year period. For the two highest quintiles, the increases that occurred in the 1982 survey were more than offset by declines in 1986, which in turn were more than offset by increases again in 1992.

The rise in the shelter cost-to-income ratios in the three lowest quintiles suggests that both lower- and middle-income households on average have increased the share of their income being devoted to shelter. While it is quite likely that households with the lowest incomes had little choice in what they pay for housing, it was probably a matter of choice to spend relatively more on housing for more households in the second and middle quintiles.

2.2.3 Households Paying 30 Percent or More of Their Income for Shelter by Tenure

There has been an increase over time in the proportion of households in Canada paying 30 percent or more of their income for shelter (see Figure 2-4). The proportion of households (remember the data do not include the adequacy or suitability dimensions of housing needs) above this STIR norm climbed from 12.7 percent to 20.1 percent between 1978 and 1992. The increase over the period as a whole occurred entirely in households renting or owning and having a mortgage.

2.2.4 Summary, STIR Trends, 1978-1992

A look at the FAMEX data over the 1978-1992 period suggests that Canadians have been devoting larger percentages of their pre-tax incomes to shelter and that the increases have been related to times of economic weakness and

high interest rates. The increases have been most pronounced for renters and homeowners with mortgages and households in the two lowest income quintiles.

2.3 A REVIEW OF AVERAGE SHELTER COST-TO-INCOME RATIOS BY HOUSEHOLD CHARACTERISTICS AND LOCATION IN 1992

Figure 2-5: Average Shelter Cost-to-Income Ratio by Household Size, Canada, 1992

Size of Household	Estimated Number of Households	Average Shelter Cost (Dollars)	Average Income (Dollars)	Average Shelter Cost to Average Income** (Percent)
1 Person	1,094,774	6,555	29,239	32.32
2 Persons	2,346,234	7,200	39,685	24.43
3 Persons	1,584,508	8,210	50,804	20.01
4 Persons	2,034,233	9,110	54,439	19.74
5 Persons	598,320	9,871	62,064	19.27
6+ Persons	160,166	10,750	61,993	19.42
All Households	7,818,235	8,161	46,601	23.00

**Calculated from the individual sample records rather than the averages shown in table

Source: Tabulated from Statistics Canada, 1992 FAMEX

Figure 2-4: Proportion of Households Paying 30 Percent or More of Their Income for Shelter, Canada

	Spending Units			Households	
	1978	1982	1986	1986	1992
(Percent of Households in Tenure Group)					
Renters	18.0	22.4	25.9	26.4	33.1
Owners Without Mortgages	9.4	9.3	7.1	7.0	8.5
Owners With Mortgages	9.8	11.7	10.3	10.3	14.9
All Households	12.7	15.0	15.6	15.6	20.1

Historically, FAMEX released data on "spending units" which is not quite the same as "households"; 1986 provides a link between estimates based on spending units and estimates based on households

Source: John Engeland, *Canadians and Their Housing Expenditures 1978-1992*, CMHC, October, 1994 (Table 3)

This section explores average shelter cost-to-income ratios for various characteristics including household size, household composition, income, tenure, and location by size of area and by region to determine the nature of any relationships that may exist between average STIRs and the indicated variables. When considering these relationships, it is important to be aware that there can be considerable variation among households with the same characteristics. Thus, it is useful to examine the median

(midpoint of an array of households) as well as the average STIR, to identify how well specific averages actually represent the situation within particular subgroupings of households. This is done at the end of the section.

2.3.1 Average STIRs by Household Size

The average STIR is highest for smaller households (one and two persons) and fairly constant for larger households (see Figure 2-5). The shelter cost-to-income ratio drops sharply from 32.3 percent for one-person households to 24.4 percent for households with two persons and then stabilizes at 19 percent to 20 percent for households ranging in size from three to six or more persons.

The average STIR for all households (representing the average of individual household STIRs) is 23 percent. This is significantly higher than the average proportion of aggregate household income spent on shelter shown to be 16.3 percent in Figure 2-2. The latter is biased down by the large share of total income accounted for by higher-income households who have quite low shelter spending in relation to income.

2.3.2 Average STIRs by Household Composition

The average STIR is the highest for individuals, both below and above the age of 65 years, and for single parents with two or more children (see Figure 2-6). The average STIR is lowest for couples without children (both above and below 65 years) and couples with only one child.

In terms of patterns in the average shelter cost-to-income ratio, it appears that:

- Couples without children at home have significantly lower average STIRs than individuals living alone (holds for both seniors and non-seniors);
- The average STIR rises for couples having more children; and

- Single parents have higher average STIRs than couples with the same number of children.

Rather surprisingly, the average STIR for single-parent households with three or more children is lower than for single-parent households with two children – in contrast, for couples, the ratio rises consistently as the number of children in the household increases. This could be a sample aberration given the small number of households.⁹ The ratio is higher for single parents with two children than for single parents with one child.

2.3.3 Average STIRs by Tenure

The average STIR is highest for renters, followed closely by homeowners with mortgages on their homes. Homeowners who do not have a mortgage have a much lower average STIR (see Figure 2-7).

The average STIR for renters is a high 28.8 percent (based on averaging the STIRs for each individual renter household).⁹

2.3.4 Average STIRs by Income Quintile

There is definitely a close relationship between average STIRs and household incomes, with the average STIR falling as income rises (see Figure 2-8). The average STIR is more than three times as high for the households in the lowest income quintile than in the highest quintile – 41.6 percent versus 13.6 percent. This relationship is the result of the demand for shelter being rather income inelastic – that is, households have a basic shelter requirement which does not rise in step with income.

The average STIR for households in the middle income quintile is 19.3 percent. The vast majority of households in core housing need belong to the bottom quintile, and the rest fall in the second quintile.

Figure 2-6:
Average Shelter Cost-to-Income Ratio by Household Composition, Canada, 1992

Household Composition	Estimated Number of Households	Average Shelter Cost	Average Income	Average Shelter Cost to Average Income*
		(Dollars)		(Percent)
<u>Households with Heads Under Age 65</u>				
Individual	1,073,552	6,447	28,858	33.46
Couple/No Children	1,294,723	8,194	52,688	18.36
Couple/1 Child	1,701,321	9,847	65,520	17.86
Couple/2 Children	873,209	11,416	60,798	21.26
Couple/3+ Children	287,820	11,188	58,454	23.97
Single Parent/1 Child	441,382	7,139	35,414	25.20
Single Parent/2 Children	122,804	8,144	29,959	30.60
Single Parent/3+ Children	37,180 *	6,840	26,034	28.00
<u>Households with Heads Aged 65+</u>				
Individual	760,860	4,821	16,479	34.08
Couple	719,621	5,213	32,557	19.02
<u>All Other Households</u>	<u>502,763</u>	8,331	49,854	19.75
All Households	7,818,235	8,162	46,601	23.00

* Caution: small sample size

**Calculated from the individual sample records rather than the averages shown in table

Source: Tabulated from Statistics Canada, 1992 FAMEX

2.3.5 Average STIRs by Size of Area

Average STIRs vary relatively little by size of urban area and for rural areas (see Figure 2-9).

The average STIR is highest for urban centres of 100,000 population and over (23.8 percent) and lowest for rural areas (20.2 percent).

Figure 2-7:
Average Shelter Cost-to-Income Ratio by Tenure, Canada, 1992

Household Tenure	Estimated Number of Households	Average Shelter Cost	Average Income	Average Shelter Cost to Average Income**
		(Dollars)		(Percent)
Renters	2,609,074	6,469	30,786	28.80
Owner Without Mortgages	2,828,010	5,236	48,306	15.50
Owner With Mortgages	<u>2,381,151</u>	13,370	61,981	25.24
All Households	7,818,235	8,161	46,601	23.00

**Calculated from the individual sample records rather than the averages shown in table

Source: Tabulated from Statistics Canada, 1992 FAMEX

Figure 2-8:
Average Shelter Cost-to-Income Ratio by Income Quintile, Canada, 1992

Household Income Quintile	Estimated Number of Households	Average Shelter Cost	Average Income	Average Shelter Cost to Average Income**
		(Dollars)		(Percent)
Lowest	1,564,575	4,557	12,669	41.64
Second	1,578,914	6,117	25,215	24.68
Middle	1,521,974	7,575	39,327	19.31
Fourth	1,576,281	9,563	55,995	17.18
Highest	<u>1,576,491</u>	12,056	94,884	13.61
All Households	7,818,235	8,161	46,601	23.00

**Calculated from the individual sample records rather than the averages shown in table
Source: Tabulated from Statistics Canada, 1992 FAMEX

Figure 2-9:
Average Shelter Cost-to-Income Ratio by Size of Area, Canada, 1992

Size of Area of Residence	Estimated Number of Households	Average Shelter Cost	Average Income	Average Shelter Cost to Average Income*
		(Dollars)		(Percent)
100,000 + Population	5,235,351	8,681	49,114	23.85
30,000-99,999	829,189	8,490	46,485	22.70
10,000-29,999	704,831	6,479	39,821	20.50
Rural	<u>1,050,904</u>	6,135	37,338	20.20
All Households	7,818,235	8,161	46,601	23.00

**Calculated from the individual sample records rather than the averages shown in table
Source: Tabulated from Statistics Canada, 1992 FAMEX

2.3.6 Average STIRs by Region

As with size of area, the differences between average STIRs in the various regions of the country are relatively small (see Figure 2-10). The average STIR in 1992 is greatest in Ontario (24.3 percent) and in British Columbia (23.1 percent) and lowest in Alberta (20.2 percent).

2.3.7 Summary: Average STIR and Household and Locational Relationships

The empirical analysis to this point has found several relationships of varying strengths between average STIRs and household characteristics:

- Household income – not surprisingly, there is a strong inverse relationship between average STIR and income quintile;

Figure 2-10:
Average Shelter Cost-to-Income Ratio by Region, Canada, 1992

Region of Residence	Estimated Number of Households	Average Shelter Cost	Average Income	Average Shelter Cost to Average Income**
		(Dollars)		(Percent)
British Columbia	889,555	7,637	45,007	23.14
Alberta	670,902	8,003	49,353	20.17
Manitoba/ Saskatchewan	580,895	6,433	40,244	20.51
Ontario	2,897,523	9,289	50,419	24.29
Quebec	2,135,753	6,862	41,585	21.89
Atlantic	643,604	6,341	39,033	20.75
All Households	7,818,235	8,161	46,601	23.00

**Calculated from the individual sample records rather than the averages shown in table
Source: Tabulated from Statistics Canada, 1992 FAMEX

- Location – average STIRs are fairly constant by size of area and by region; and
- Household size – average STIRs drop for one- and two-person households then stabilize for the three to six-plus size groups.

For tenure, the average STIRs are close for renters and households with mortgages, and there are a number of patterns within the household composition grouping (but no overall pattern).

Lastly, a number of household subgroups have average STIRs of 30 percent or more including households with unattached individuals only (both seniors and younger) and households in the lowest income quintile. Only one subgroup (single parents with two children) has an average STIR close to 30 percent.

2.4 A DIGRESSION – AVERAGE VERSUS MEDIAN STIRS

As mentioned previously, there is the possibility that the average STIRs for the various characteristics may be distorted to some extent by the fact that the average STIRs by subgroup may not be representative. Using the median STIR helps to mitigate this potential distortion to some degree by reducing the influence of very high or

very low values at either end of the array of households.

Figure 2-11 compares the average and median STIRs for the various household and locational characteristics examined in Section 2.3. In general, the median STIRs are lower than the average STIRs by the various breakdowns and for all households – for all households, the median STIR is 18.3 percent compared to 23 percent for the average STIR. Otherwise, a comparison of the two STIR concepts in Figure 2-11 shows that the patterns using medians are virtually the same as those found through the review of average STIRs. Thus, it is reasonable to use average STIRs as the foundation of the analysis here.

2.5 A MORE DETAILED LOOK AT AVERAGE STIRS CROSS-TABULATED BY TENURE

A series has been tabulated for the same household and locational attributes looked at in Section 2.3 but with a cross-tabulation of all variables by tenure. Thus, relationships in average STIRs are explored for each of three tenure groups: renters, owners with mortgages, and owners without mortgages.

Figure 2-11:
Average and Median Shelter Cost-to-Income Ratios by Household Characteristics and Location, Canada, 1992

	Average STIR	Median STIR		Average STIR	Median STIR
	(Percent)			(Percent)	
Size of Household					
1 Person	32.32	23.63	Household Tenure		
2 Persons	24.43	20.68	Renters	28.80	23.75
3 Persons	20.01	17.32	Owners Without Mortgages	15.50	10.80
4 Persons	19.74	16.85	Owners With Mortgages	25.24	21.44
5 Persons	19.27	16.50	Household Income Quintile		
6+ Persons	19.42	15.28	Lowest	41.64	33.47
Household Composition					
<u>Households with Heads</u>			Second	24.68	21.76
<u>Under Age 65</u>			Middle	19.31	17.17
Individual	33.46	23.64	Fourth	17.18	15.50
Couple/No Children	18.36	15.77	Highest	13.61	12.04
Couple/1 Child	17.86	14.89	Size of Area of Residence		
Couple/2 Children	21.26	18.67	100,000+ Population	23.85	19.50
Couple/3+ Children	23.97	20.26	30,000-99,999	22.70	19.06
Single Parent/1 Child	25.20	20.21	10,000-29,999	20.50	17.69
Single Parent/2 Children	30.60	26.60	Rural	20.20	15.55
Single Parent/3+ Children	28.00 *	25.38 *	Region of Residence		
<u>Households with Heads</u>			British Columbia	23.14	18.03
<u>Aged 65+</u>			Alberta	20.17	17.69
Individual	34.08	29.94	Manitoba/		
Couple	19.02	16.27	Saskatchewan	20.51	17.48
<u>All Other Households</u>			Ontario	24.29	19.89
	19.75	16.78	Quebec	21.89	18.55
			Atlantic	20.75	17.36
			All Households	23.00	18.26

* Caution: small sample size

Source: Tabulated from Statistics Canada, 1992 FAMEX

* Caution: small sample size

Source: Tabulated from Statistics Canada, 1992 FAMEX

2.5.1 Average STIRs by Tenure and Household Size

As noted in Section 2.3.1, for all households the average STIR drops sharply for households with one to three persons and then stabilizes for larger households. Figure 2-12 shows that the same pattern more or less holds for each of the three tenure groups.

Other highlights include:

- The average STIRs for renters and owners with mortgages are comparable for each size group; and

- Owners without mortgages have much lower average STIRs than the other tenure groups across all size groups.

2.5.2 Average STIRs by Tenure and Household Composition

The data in Figure 2-13 provides additional insight into the variations in average STIR by household types. In particular:

- The gap in average STIRs between senior couples and individuals is narrowed considerably if only renters are considered.

Figure 2-12:
Average Shelter Cost-to-Income Ratio by Tenure and Household Size, Canada, 1992

Size of Household	Owners With Mortgages	Owners Without Mortgages	All Renters	All Households
<i>Average Shelter Cost-to-Income Ratio (Percent)**</i>				
1 Person	36.09	21.82	35.79	32.32
2 Persons	26.81	18.77	29.01	24.43
3 Persons	25.02	13.56	24.06	20.01
4 Persons	23.56	14.09	24.36	19.74
5 Persons	23.78	13.65	21.73	19.27
6+ Persons	24.14	9.30	25.57	19.42
All Households	25.24	15.50	28.80	23.00
<i>Distribution of Households by Tenure (Percent)</i>				
1 Person	16.29	17.39	66.32	100.00
2 Persons	20.89	37.09	42.02	100.00
3 Persons	34.38	39.82	25.81	100.00
4 Persons	40.01	41.81	18.18	100.00
5 Persons	47.22	38.56	14.22	100.00
6+ Persons	44.70	34.50 *	20.81 *	100.00
All Households	30.46	36.17	33.37	100.00

* Caution: small sample size

**Calculated from the individual sample records rather than the averages shown in table

Source: Tabulated from Statistics Canada, 1992 FAMEX

The wide gap in average STIR for all households in the seniors' age group is very much influenced by the fact that the majority of singles are renters with very high shelter cost-to-income ratios while the majority of couples are owners without mortgages with relatively low STIRs.

- There is a clearer relationship among couples by the number of children and their average STIR for renters than for all households.

For renters, the average STIR increases continually when moving from couples without children through to couples with three or more children.

- Single-parent renters with one and two children have the same average STIR.

While the average STIR for all single-parent households is larger for households with two children rather than one child, this is not the case for renters (see Figure 2-13). Unfortunately, the sample size is too small for single-parent households with three or more children to identify the relationship for larger single-parent renter households.

For each tenure group, single-parent households with a similar number of children as households with both parents have much higher average STIRs.

Figure 2-13:
Average Shelter Cost-to-Income Ratio by Tenure and Household Composition, Canada, 1992

Household Composition	Owners With Mortgages	Owners Without Mortgages	All Renters	All Households
Average Shelter Cost-to-Income Ratio (Percent)**				
<u>Households with Heads Under Age 65</u>				
Individual	35.62	21.29	35.99	33.46
Couple/No Children	24.77	13.47	18.45	18.36
Couple/1 Child	22.67	11.06	19.97	17.86
Couple/2 Children	24.24	12.62	21.05	22.26
Couple/3+ Children	25.01	20.41 *	24.01 *	23.97
Single Parent/1 Child	29.76	14.44	29.15	25.20
Single Parent/2 Children	33.44 *	16.92 *	30.11	30.60
Single Parent/3+ Children	35.15 *	14.84 *	26.35 *	28.00 *
<u>Households with Heads Aged 65+</u>				
Individual	47.78 *	27.34	38.55	34.08
Couple	28.05 *	15.57	28.57	19.02
<u>All Other Households</u>	23.84	14.55	23.16	19.75
All Households	25.24	15.50	28.80	23.00
Distribution of Households by Tenure (Percent)				
<u>Households with Heads Under Age 65</u>				
Individual	15.58	17.33	67.09	100.00
Couple/No Children	30.52	41.37	28.11	100.00
Couple/1 Child	44.85	37.81	17.34	100.00
Couple/2 Children	61.85	22.64	15.51	100.00
Couple/3+ Children	62.43	20.33 *	17.24 *	100.00
Single Parent/1 Child	21.35	27.91	50.74	100.00
Single Parent/2 Children	28.34 *	4.36 *	67.30	100.00
Single Parent/3+ Children	23.82 *	5.49 *	70.69 *	100.00 *
<u>Households with Heads Aged 65+</u>				
Individual	2.59 *	42.97	54.43	100.00
Couple	6.21 *	74.20	19.59	100.00
<u>All Other Households</u>	26.55	42.57	30.88	100.00
All Households	30.46	36.17	33.37	100.00

* Caution: small sample size

**Calculated from the individual sample records rather than the averages shown in table

Source: Tabulated from Statistics Canada, 1992 FAMEX

Figure 2-14:
Average Shelter Cost-to-Income Ratio by Tenure and Income Quintile, Canada, 1992

<u>Household Income Quintile</u>	<u>Owners With Mortgages</u>	<u>Owners Without Mortgages</u>	<u>All Renters</u>	<u>All Household</u>
<u>Average Shelter Cost-to-Income Ratio (Percent)**</u>				
Lowest	68.25	32.86	43.95	41.64
Second	37.35	16.95	26.39	24.68
Middle	27.68	12.52	19.18	19.31
Fourth	22.83	10.11	15.03	17.18
Highest	18.27	7.76	12.25	13.61
All Households	25.24	15.50	28.80	23.00
<u>Distribution of Households by Tenure (Percent)</u>				
Lowest	5.55	33.33	61.12	100.00
Second	17.59	39.47	42.94	100.00
Middle	30.21	36.56	33.24	100.00
Fourth	46.84	32.19	20.96	100.00
Highest	51.92	39.30	8.78	100.00
All Households	30.46	36.17	33.37	100.00

**Calculated from the individual sample records rather than the averages shown in table

Source: Tabulated from Statistics Canada, 1992 FAMEX

2.5.3 Average STIRs by Tenure and Income Quintile

Figure 2-14 reveals a consistent decline in the average STIR across all tenure groups, as the income quintile increases.

Other highlights include:

- Owners with mortgages have substantially higher average STIRs in each quintile than the other two tenure groups; and
- Renters have higher average STIRs than owners without mortgages across the income quintile spectrum.

2.5.4 Average STIRs by Tenure and Area of Residence

The fairly constant relationship between average STIR and area of residence also holds for owners with and without mortgages and for renters in urban centres (see Figure 2-15). The only place where the relationship is different is in rural areas. The relatively few renters in rural areas have a lower STIR than other renters.

2.5.5 Average STIRs by Tenure and Region

There is a remarkable similarity in the average STIRs by tenure group within the various regions of the country given the wide variation in housing costs, especially house prices, that prevails (see Figure 2-16). Average STIRs in British Columbia and Ontario are somewhat higher for each tenure group than in the other regions.

Figure 2-15:
Average Shelter Cost-to-Income Ratio by Tenure and Size of Area, Canada, 1992

Size of Area of Residence	Owners With Mortgages	Owners Without Mortgages	All Renters	All Households
<i>Average Shelter Cost-to-Income Ratio (Percent)**</i>				
100,000+ Population	25.60	15.65	29.40	23.85
30,000-99,999	24.18	14.24	28.77	22.70
10,000-29,999	22.59	14.35	27.15	20.50
Rural	25.84	16.18	22.63	20.20
All Households	25.24	15.50	28.80	23.00
<i>Distribution of Households by Tenure (Percent)</i>				
100,000+ Population	30.40	32.00	37.60	100.00
30,000-99,999	33.80	33.13	33.07	100.00
10,000-29,999	27.73	41.71	30.56	100.00
Rural	29.94	55.62	14.45	100.00
All Households	30.46	36.17	33.37	100.00

**Calculated from the individual sample records rather than the averages shown in table

Source: Tabulated from Statistics Canada, 1992 FAMEX

Figure 2-16:
Average Shelter Costs-to-Income Ratio by Tenure and Region, Canada, 1992

Region of Residence	With Mortgages	Without Mortgages	All Renters	All Households
<i>Average Shelter Cost-to-Income Ratio (Percent)**</i>				
British Columbia	24.27	16.84	31.33	23.14
Alberta	23.97	12.82	24.95	20.17
Manitoba/ Saskatchewan	23.58	13.72	28.53	20.51
Ontario	26.85	16.55	29.95	24.29
Quebec	23.14	14.20	27.30	21.89
Atlantic	23.66	14.13	27.70	20.75
All Households	25.24	15.50	28.80	23.00
<i>Distribution of Households by Tenure (Percent)</i>				
British Columbia	27.05	42.59	30.37	100.00
Alberta	29.15	36.93	33.92	100.00
Manitoba/ Saskatchewan	31.12	42.68	26.21	100.00
Ontario	32.62	34.54	32.84	100.00
Quebec	29.10	31.72	39.18	100.00
Atlantic	30.67	42.78	26.54	100.00
All Households	30.46	36.17	33.37	100.00

**Calculated from the individual sample records rather than the averages shown in table

Source: Tabulated from Statistics Canada, 1992 FAMEX

2.5.6 Summary: Average STIR Relationships by Tenure and Household and Locational Attributes

Standardizing the average STIRs for differences in tenure helps to better understand the overall patterns identified in Section 2.3. Also, there is some improvement in the strength of the relationship between the average STIRs and household and locational characteristics, especially for renters. In particular:

- The close inverse relationship between average STIRs and income quintiles holds for each of the three tenure groups.
- The levels of average STIRs for renters and owners with mortgages are generally quite similar for households by size and fairly similar by location.
- The average STIR pattern found for households by size (declines and then stabilizes) and by location (fairly constant) generally holds for each tenure group.

2.6 IMPLICATIONS OF THE AVERAGE STIRS ANALYSIS FOR THE FIXED 30 PERCENT STIR NORM USED IN THE CORE HOUSING NEED MODEL

Two key implications for the use of an average STIR norm as an input into core housing need can be drawn from the findings of the empirical analyses reported on in the preceding sections:

- Significant variations in average STIRs by household subgroups cast doubt on the application of a fixed-STIR norm and suggest that some form of variable-STIR norm should be examined as an alternative; and
- There are relationships between household characteristics – namely household income, household size, average STIRs – that should be considered in the formulation of variable-STIR options.

2.7 FIXED AND VARIABLE STIRS ACCORDING TO THE LITERATURE

The previous sections of this chapter examined actual shelter cost-to-income spending patterns in Canada over time and by various household and location characteristics. The analysis is essentially descriptive, aimed at determining whether there might be some systematic relationship between shelter costs and incomes, which could be used as support for the current 30-percent fixed-STIR norm, a fixed STIR with a different STIR norm or a form of a variable STIR.

This section reviews a cross-section of relevant studies and reports done in the past which deal with the issue of housing affordability and its measurement from a housing policy perspective. An emphasis is placed on specific assumptions used for key variables and the concepts and frameworks used to assess affordability issues. A total of nine studies and reports are examined – all but one are from Canadian sources.

2.7.1 Basis for Deriving Measures of Shelter Affordability Norms

The various studies and reports are examined and compared in terms of the following elements:

- Source of the base information
- Household universe considered
- Income
- Shelter costs (owners and renters)
- Essential expenditures excluding shelter
- Shelter cost-to-income ratio used as norm or threshold for determining an affordability problem

Each of these is considered below. Figure 2-17 provides a summary of the individual studies.

Figure 2-17:
Summary of Key Elements Used in Past Studies Measuring Shelter Affordability Norm

Name of Study	Date Source	Household Exclusions	Income	Shelter Costs - Owners	Shelter Costs - Renters	Essential Expenditures	Appropriate Shelter Cost/Income Norm
Housing Affordability and Willingness to Pay Centre for Urban and Community Studies, University of Toronto, John R. Miron, June 1984	FAMEX (1978)	Farm households, renters living rent-free, lodgers, units whose composition or tenure changed during 1978	Before-tax income	Owned living quarters as per FAMEX: maintenance/repairs, property taxes, homeowners' insurance premiums, mortgage interest, and utilities	Rented living quarters: rent, utilities	N.A.	25 percent STIR
Canadian Housing Allowances: An Economic Analysis, Ontario Economic Council, Marion Steele, 1985	HIFE (1976) & Survey of Housing Units (1974)	Subsidized households	Poverty line income as defined by Statistics Canada's low income cut-off (the income at which 62 percent must be spent on food, shelter and clothing - this is 20 percent above the income of the average household)	N.A.	Described only as "rent"	N.A.	Used 30 percent STIR as base for calculating the following variable STIRs: 40, 30, 25, 22.5, and 20 percent for household sizes of 1, 2, 3, 4, and 5+, respectively
Becant Trends in Housing Quality and Affordability, A. Blais, M.I.T. & Harvard University, William C. Apper Jr., 1985	U.S. Annual Housing Survey (1974 and 1981)	N.A.	N.A.	N.A.	Described only as "rent"	N.A.	35 percent STIR
Core Housing Need in Canada, CMHC, 1991 & Technical Guide to Understanding 1991 Core Housing Need Data, Bears and Entolades, CMHC, Summer 1994	1991: HIFE (1986) 1994: HIFE (1991) and 1991 Census of Canada	Households in Yukon, Northwest Territories, and the Institutionalized or homeless are not represented; households with zero income or with STIRs in excess of 100 percent; households considered as still in school full-time	Before-tax income	Payments for mortgage principle and interest, property taxes, utilities, and applicable condominium fees	Rent, payments for utilities	N.A.	30 percent STIR
Non-Profit Housing, Housing Allowances or Income Assistance, A. Chelton, American Policy Instruments, George Fain, CMHC, July 1992	N.A.	N.A.	Before-tax income	N.A.	N.A.	Statistics Canada's low income cut-off (the income at which 62 percent must be spent on food, shelter and clothing - this is 20 percent above the income of the average household)	30 percent STIR

Figure 2-17: (Continued)
Summary of Key Elements Used in Past Studies Measuring Shelter Affordability Norm (Continued)

Name of Study	Data Source	Household Exclusions	Income	Shelter Costs: Owners	Shelter Costs: Renters	Essential Expenditures	Appropriate Shelter Cost/Income Norm
Assessment of a Variable Shelter Cost-to-Income Measure of Affordability Boriss Marilena, CMHC, March 1992	FAMEX (1986)	Boarders, renters occupying free accommodation, households whose tenure status changed during the reference year, and with mortgage principal repayments of \$12,000+	Before-tax income	Cost of owned living quarters from FAMEX adjusted for calculating core need; property taxes, mortgage interest and principal repayment, and utilities	Rented living quarters: rent, utilities	Food, shelter, clothing costs, personal income taxes, and household operations, personal care, health care, and transportation	Used 30 percent STIR as base for calculating the following variable STIRs: 35, 30, 28, 27, and 25 percent for household sizes of 1, 2, 3, 4-5, and 6+, respectively
Canadians and Their Housing Expenditures, 1978-1992 John Engleand, CMHC, March 1994	FAMEX (1978, 1982, 1986, 1992)	Households in Yukon, Northwest Territories, on Indian reserves, and inmates of institutions are not represented, and some households are excluded for purposes of measuring housing affordability	Before-tax income	Owned living quarters as per FAMEX: maintenance/repairs, property taxes, homeowners' insurance premiums mortgage interest, and utilities (excludes principal repayment of mortgage)	Rented living quarters: rent, utilities	N.A.	30 percent STIR
Housing Benefits: Consumer Behaviour as a Basis for Income Redistribution Policy Dellard Rungie, Unpublished CMHC Report, November 1994	FAMEX (1986)	Households reporting negative income, in receipt of social assistance, or containing adults 17+ years of age who were not the household head or spouse	Before-tax income	Owned living quarters as per FAMEX: maintenance/repairs, property taxes, homeowners' insurance premiums mortgage interest, and utilities (excludes principal repayment of mortgage)	Rented living quarters: rent, utilities	Food, shelter, clothing costs, personal income taxes, and costs associated with household operations, personal care, health care, and transportation	Variable STIRs implicitly derived through equivalence scale (showed the minimum household income needed by different household types to maintain a similar standard of living)
"Results of the Low Income Review", Income Distributions by Size in Canada. Cat. 13-207, Appendix Statistics Canada, 1990 (1) LICO (Low Income Cut-Off) (2) LIM (Low Income Measure)	(1) FAMEX	Households in Yukon, Northwest Territories, on Indian reserves, and inmates of institutions are not represented	LICO-a low income measure based on essential expenditures; refers to the low income cut-off calculated at 20 percent above what average household (of comparable size) spends on essentials; either before or after-tax income is used, depending on specific measure chosen	N.A.	N.A.	Food, shelter, and clothing	N.A.
(2) SCF (Survey of Consumer Finances)	(2) SCF (Survey of Consumer Finances)	Households in Yukon, Northwest Territories, on Indian reserves, and inmates of institutions are not represented	LIM-a low income measure based on relative family income; set at 50 percent of median family income (adjusted for family size); either before or after-tax income is used, depending on specific measure chosen	N.A.	N.A.	Makes an adjustment to income to allow for increasing family needs as size increases (calculation of essential expenditures not required)	N.A.

2.7.1.1 Base Information

Almost all the Canadian sources utilize FAMEX as the primary information source. This is not surprising since FAMEX is the most comprehensive source of household data, including household and housing characteristics and detailed shelter and non-shelter spending, income, and net changes in wealth.

One study (Steele) uses HIFE, but this study examined only renters, and one (CMHC, **Technical Guide to Understanding 1991 Core Housing Need Data Bases and Estimates**) used both HIFE and the 1991 Census of Canada (the latter to provide much greater local area estimates).

The single U.S. study used data from the Annual Housing Survey (in Canada, HIFE provides some of the information contained in this U.S. source).

2.7.1.2 Household Universe

Most analyses do not use all the usable household records as reported in the FAMEX survey. A number of households are excluded for various reasons just as is done in the study here. Among the exclusions are (not all studies exclude the same households): farm families, renters living rent-free, households changing tenure during the reporting year, households receiving social assistance, households containing adults other than the household head or spouse, households reporting zero or negative incomes or shelter costs, and homeowners making large mortgage principal repayments.

For Core Housing Need estimates derived from HIFE, households with shelter cost-to-income ratios of 100 percent or more are excluded.

2.7.1.3 Income

The FAMEX income before taxes figures are most frequently used in the studies and reports examined. Thus, income from wages and salaries, self-employment, investments, government transfer payments, and pensions are all included

as income. This income concept is sometimes called "money income" or "current income." Capital gains and revenues from sources such as gambling and inheritances are not considered to be income directly. These are considered as changes in wealth.

The literature also refers to alternative income measures, such as permanent income, which takes into consideration future earnings potential (human capital).

2.7.1.4 Shelter Costs: Owners

Several studies and reports utilized the FAMEX definition of shelter costs for owned living quarters while others made adjustments. Under FAMEX, the shelter costs of homeowners include mortgage interest, property taxes, utilities, repairs and maintenance, and insurance, but exclude mortgage principal repayments.

The Core Housing Need framework excludes outlays for repairs and maintenance and insurance but includes principal repayments. Mazikins follows these conventions with the exception that owners with mortgage repayments which are negative or above \$12,000 in the year under consideration are excluded.

2.7.1.5 Shelter Costs: Renters

All studies define these costs as cash rents and utility outlays, if utilities are not included in the rent. The FAMEX includes some other costs, such as contents insurance, but these are insignificant.

2.7.1.6 Non-Shelter Essentials Spending

Mazikins and Runge have a rather all-encompassing concept of what constitutes "essentials" other than shelter. These include food, clothing, household operations, personal care, health care and transportation.

In contrast, Statistics Canada, in calculating its Low-Income Cut-Offs, only considers spending on food and clothing (as well as shelter) as essential. Fallis utilizes this measure too.

Figure 2-18:
Summary of Key Elements Used in Past Studies to Measure a Variable STIR

Name of Study	Equity	Case for Variable STIR	of Variable STIR
Canadian Housing Allowances: An Economic Analysis. Marion Stiegle, 1985	A fixed STIR does not take into account variations in household size.	Larger households spend more money on non-housing goods to achieve the same level of utility as smaller households. Also, non-poor large households spend a lower percentage of income on housing than non-poor small households.	Assumes a 30 percent-STIR is appropriate for a two-person household. For other household sizes, different STIRs are calculated using Statistics Canada's LICO (low income cut-offs).
Assessment of a Variable Shelter Cost-to-Income Measure of Affordability. Boris Mazitkins, CMHC, March 1992	A fixed STIR does not take into account variations in household size.	At the same STIR, the income remaining after budgeting for essential expenditures (for the residual income) is less for larger families compared to small families.	Assumed a 30 percent-STIR to be appropriate for a two person household, and determined that residual income was 52.3 percent lower for households at the 30 percent STIR than for households at the average STIR.
Housing Benefits: Consumer Behaviour as a Basis for Income Redistribution. Policy Dallard Bunge, CMHC, November 1994	A fixed STIR is not vertically equitable - it does not treat different types of households with different needs systematically differently. It does not take into account variations in household composition.	Children require lower expenditures than adults. It follows that at the affordability threshold, all household expenditures should be considered, not just expenditures on shelter.	STIRs were then determined for the remaining household sizes, such that the percentage reduction in residual income was consistent across all household groups (52.3 percent). An equivalence scale of incomes was generated based on an initial threshold residual income assumption. Across these threshold incomes, the proportion of per capita residual income was equalized. Using these threshold incomes, it is possible to calculate a set of variable STIRs.

2.7.1.7 Shelter Cost-to-Income Norm

Most studies use a 30-percent STIR as an appropriate threshold for a fixed STIR to determine housing affordability. The exceptions are a study by Miron in 1984, which uses 25 percent, and the U.S. study examined (Apgar), which uses 35 percent.

For studies considering a variable STIR as a norm (Steele and Mazikins), 30 percent is still a critical element for the analysis (applied to a "standard" household with norms for other households varying below and above the 30 percent).

Both Runge and Statistics Canada in its Low Income Measure do not explicitly consider shelter costs – Runge combines them with non-shelter essentials spending and Statistics Canada looks just at relative income levels across households of different sizes.

2.7.2 Formulation of a Variable STIR

Three of the studies examined calculated variable STIRs (see Figure 2-18).

Steele based her estimates on the Low-Income Cut-Offs of Statistics Canada, and made estimates of a variable-STIR norm according to household size. According to her estimates, the STIR norm varies from 40 percent for one-person households to 20 percent for households with five or more persons.

Mazikins calculates the percentage reduction in the residual income for a two-person household and, based on comparable reductions for smaller and larger households, estimates a variable-STIR norm ranging from 35 percent for one-person households to 25 percent for households with six or more persons.

While Runge did not estimate a variable STIR directly, there is one built into his approach (ranging from 16.4 percent for couples with three or more children to 44.2 percent for single adults aged 65 years and over). Runge differs from the previous two studies in that he looks at household

composition rather than household size as the appropriate household base.

2.7.3 Summary: Literature Search

The literature search shows that most of the studies examined use a 30-percent STIR as a norm for assessing the affordability need for housing assistance. The 30 percent is based on usage or previous studies – it really does not have any particular empirical or theoretical support.

Regarding a variable STIR, the literature review exhibits support for a variable over a fixed-STIR norm. However, the literature does not agree on the household characteristics that should form the basis of any scheme (though there is more support for household size than for household composition) nor the specific formula to be applied. There is also a question of what should be considered essential non-shelter spending for the analysis.

2.8 IMPLICATIONS OF THE LITERATURE REVIEW FOR THE FIXED 30-PERCENT STIR NORM USED IN THE CORE HOUSING NEED MODEL

The literature search supports the findings of the empirical analysis that the use of a fixed-STIR norm is not based on a strong foundation. The choice of a fixed-STIR norm and a particular value (e.g., 30 percent) is based on precedence and consensus rather than conceptual or empirical support.

Both the literature search and the empirical analysis point to a variable-STIR norm having a more solid basis than a fixed STIR, especially a variable STIR premised on differences in household size. But general support for a variable over a fixed STIR does not mean there is agreement on specifics. As Steele concludes: "The evidence in favour of a variable affordability ratio does not strongly point to any single set of numbers."¹⁰

2.9 REVIEW OF RESIDUAL INCOME RATIOS BY HOUSEHOLD CHARACTERISTICS AND LOCATION IN 1992

The literature review suggests an alternative approach to the fixed-STIR norm for assessing affordability to determine housing need. This alternative approach treats shelter as only one element of the spending on essentials by households, albeit the most important in terms of dollar spending.

This section examines relationships between household and location characteristics and the variables that are key for the implementation of an alternative approach, i.e., spending on essentials, before-tax income, residual income (income remaining after spending on essentials), and residual income in relation to pre-tax income.

"Essentials" for the purpose here are measured in the same way as in Mazikins and Runge. That is, spending on essentials includes: shelter, food, clothing, personal taxes (mainly income), household operations, transportation, health and personal care. This is a very broad concept of essential spending, but it is used to maintain consistency with earlier research into a variable-STIR norm. As noted earlier (Section 2.7.1.6), Statistics Canada's estimates of Low-Income Cut-Offs consider only shelter, food and clothing as "essentials."

The rationale behind a broadened measure of spending which includes non-shelter as well as shelter "essentials" is that "...families of different sizes are at equivalent levels of living when they spend the same proportion of their income on necessities." This approach seems to recognize, at least implicitly, that in Canada families should be able to maintain a certain "minimum standard of living" which, while possibly falling short of the average, still reflects the norms of contemporary society. It is recognized that shelter cost assistance to lower-income Canadians is really part of the broader income redistribution initiatives of the two senior levels of government.

While the specifics can differ for variable-STIR norm approaches, the basic message is that the lower the average residual income-to-pre-tax income ratio (RITPIR), the more the households are in need of some form of housing assistance, and the amount of assistance should be relatively greater for households with lesser RITPIRs.

The household RITPIR analyses below are conducted for the same household and location characteristics used for the average STIR analyses contained in Sections 2.3 and 2.5.

2.9.1 Average RITPIR by Household Size

The average RITPIR falls within a narrow range (17.0 to 20.8 percent) for households with two or more persons (see Figure 2-19). This represents the proportion of income remaining for discretionary spending after allowing for all spending on essentials. However, the picture is dramatically different for one-person households where the RITPIR is a negative 3.3 percent.

This result for one-person households is influenced by the fact that some households in the sample have essentials spending in excess of their income. In fact, 19 percent of the one-person households in the sample reported zero or negative income in the year 1992. This distorts the average RITPIR, which is calculated as the average of the RITPIRs for each household in the sample. This can arise for example if the individual living alone is receiving financial support from relatives or is temporarily using savings to maintain spending.¹¹

2.9.2 Average RITPIRs by Household Composition

There are some noticeable differences in the average RITPIR by household composition beyond the negative number for individuals under the age of 65 (which also showed up for one-person households) (see Figure 2-20). Highlights include:

Figure 2-19:
Average Residual Income-to-Income Ratio by Household Size, Canada, 1992

<u>Size of Household</u>	<u>Estimated Number of Households</u>	<u>Average Spending on Essentials</u>	<u>Average Income</u>	<u>Average Residual Income</u>	<u>Residual Income Share of Pre-tax Income **</u>
		<i>(Dollars)</i>			<i>(Percent)</i>
1 Person	1,094,774	22,496	29,239	6,743	(3.31)
2 Persons	2,346,234	29,222	39,685	10,463	19.83
3 Persons	1,584,508	37,741	50,804	13,063	20.79
4 Persons	2,034,233	40,702	54,439	13,736	16.95
5 Persons	598,320	47,301	62,064	14,763	18.95
6+ Persons	160,166	46,959	61,893	14,934	19.22
All Households	7,818,235	34,826	46,601	11,775	16.05

**Calculated from the individual sample records rather than the averages shown in table
Source: Tabulated from Statistics Canada, 1992 FAMEX

Figure 2-20:
Average Residual Income-to-Income Ratio by Household Composition, Canada, 1992

<u>Household Composition</u>	<u>Estimated Number of Households</u>	<u>Average Spending on Essentials</u>	<u>Average Income</u>	<u>Average Residual Income</u>	<u>Residual Income Share of Pre-tax Income **</u>
		<i>(Dollars)</i>		<i>(Percent)</i>	
<u>Households with Heads Under Age 65</u>					
Individual	1,073,552	22,186	28,858	6,673	(3.67)
Couple/No Children	1,294,723	37,643	52,688	15,045	23.07
Couple/1 Child	1,701,321	47,776	65,020	17,244	17.60
Couple/2 Children	873,209	47,066	60,798	13,732	17.59
Couple/3+ Children	287,820	46,922	58,454	11,531	11.66
Single Parent/1 Child	441,382	28,333	35,314	6,981	15.01
Single Parent/2 Children	122,804	27,240	29,959	2,718	3.56
Single Parent/3+ Children	37,180	25,009	26,034	1,025	2.49
<u>Households with Heads Aged 65+</u>					
Individual	763,860	13,089	16,749	3,660	17.16
Couple	719,621	22,977	32,557	9,580	24.66
All Other Households	502,763	36,532	49,854	13,322	23.51
All Households	7,818,235	34,826	46,601	11,775	16.05

* Caution: small sample size

**Calculated from the individual sample records rather than the averages shown in table

Source: Tabulated from Statistics Canada, 1992 FAMEX

- There is a marked difference in the average RITPIR for senior and non-senior individuals – seniors have a RITPIR close to the all-household average.
- There is an inverse relationship between household size for households with couples and the average RITPIR – the larger the household the smaller the average RITPIR.
- Single parents with one child have nearly the same RITPIR as couples with one child – however, single parents with two or more children have virtually no income remaining after paying for essentials (for the three-plus group, the sample is very small, so the result may be distorted by sampling error).

2.9.3 Average RITPIR by Tenure

Both owners with and without mortgage debt have approximately the same RITPIRs (see Figure 2-21). Renters as a group have lower average RITPIRs.

2.9.4 Average RITPIR by Income Quintile

As with average STIRs, there is a close relationship between the average RITPIR and level of income, but the relationship is direct rather than inverse (see Figure 2-22). That is, the higher the income the higher the proportion of income that remains after spending on essentials. The average RITPIR increases from a negative 16.6 percent for the lowest quintile to

Figure 2-21:
Average Residual Income-to-Income Ratio by Tenure, Canada, 1992

Household Tenure	Estimated Number of Households	Average Spending on Essentials	Average Income	Average Residual Income	Residual Income Share of Pre-tax Income **
			(Dollars)		(Percent)
Renters	2,609,074	23,762	30,786	7,024	11.71
Owner Without Mortgages	2,828,010	33,511	48,306	14,795	19.19
Owner With Mortgages	2,381,151	48,462	61,981	13,519	17.23
All Households	7,818,235	34,826	46,601	11,775	16.05

**Calculated from the individual sample records rather than the averages shown in table
Source: Tabulated from Statistics Canada, 1992 FAMEX

Figure 2-22:
Average Residual Income-to-Income Ratio by Income Quintile, Canada, 1992

Household Income Quintile	Estimated Number of Households	Average Spending on Essentials	Average Income	Average Residual Income	Residual Income Share of Pre-tax Income **
			(Dollars)		(Percent)
Lowest	1,564,575	12,064	12,669	606	(16.64)
Second	1,578,914	20,806	25,215	4,409	17.17
Middle	1,521,974	30,745	39,327	8,582	21.87
Fourth	1,576,281	41,819	55,995	14,179	25.18
Highest	1,576,491	65,494	94,884	29,390	30.38
All Households	7,818,235	34,826	46,601	11,775	16.05

**Calculated from the individual sample records rather than the averages shown in table
Source: Tabulated from Statistics Canada, 1992 FAMEX

Figure 2-23:

Average Residual Income-to-Income Ratio by Size of Area, Canada, 1992

Size of Area of Residence	Estimated Number of Households	Average Spending on Essentials	Average Income	Average Residual Income	Residual Income Share of Pre-tax Income **
			(Dollars)		(Percent)
100,000 + Population	5,235,351	36,667	49,114	12,447	14.39
30,000-99,999	829,189	34,570	46,485	11,916	20.92
10,000-29,999	704,831	29,038	39,821	10,783	22.33
Rural	<u>1,050,904</u>	28,717	37,338	8,621	17.06
All Households	7,818,235	34,826	46,601	11,775	16.05

**Calculated from the individual sample records rather than the averages shown in table
Source: Tabulated from Statistics Canada, 1992 FAMEX

30.3 percent for the highest quintile. The RITPIR for the second quintile is close to the average for all households; for the third and higher quintiles, the average RITPIRs are above the all-household average.

2.9.5 Average RITPIR by Size of Area

There is a variation in the average RITPIR by area of residence, with the RITPIR being lowest for the largest urban centres and rural areas (Figure 2-23). However, the ratios for these two areas are close to the overall average for all areas.

2.9.6 Average RITPIR by Region

Again, by region, there are differences in the average RITPIR (see Figure 2-24). The one that is prominent is for British Columbia, where the RITPIR is just 5.6 percent. For the other regions, the average RITPIR is at or somewhat above the average for all households in Canada.

The British Columbia ratio looks anomalous; it is explored in more detail in Section 2.10.5.

Figure 2-24:

Average Residual Income-to-Income Ratio by Region, Canada, 1992

Region of Residence	Estimated Number of Households	Average Spending on Essentials	Average Income	Average Residual Income	Residual Income Share of Pre-tax Income **
			(Dollars)		(Percent)
British Columbia	889,555	33,653	45,007	11,354	5.53
Alberta	670,902	36,050	49,353	13,302	19.52
Manitoba/ Saskatchewan	580,895	29,350	40,244	10,895	20.30
Ontario	2,897,526	37,239	50,419	13,181	16.06
Quebec	2,135,753	32,125	41,585	9,460	18.27
Atlantic	<u>643,604</u>	28,619	39,033	10,415	21.48
All Households	7,818,235	34,826	46,601	11,775	16.05

**Calculated from the individual sample records rather than the averages shown in table
Source: Tabulated from Statistics Canada, 1992 FAMEX

Figure 2-25:

Average Residual Income by Tenure and Household Size, Canada, 1992

Size of Household	Owners With Mortgages	Owners Without Mortgages	All Renters	All Households
<i>Average(1) Residual Income (Dollars)**</i>				
1 Person	9,522	8,103	5,330	6,743
2 Persons	13,460	11,801	6,971	10,463
3 Persons	12,636	16,511	7,199	13,063
4 Persons	14,145	15,439	8,086	13,736
5 Persons	13,475	16,988	10,096	14,763
6+ Persons	14,174	21,597 *	4,357 *	14,934
All Households	13,519	14,795	7,024	11,775
<i>Average(1) Residual Income As a Share of Pre-tax Income (Percent)</i>				
1 Person	(11.86)	12.51	(5.13)	(3.31)
2 Persons	21.64	19.77	18.35	19.83
3 Persons	27.00	16.32	17.20	20.79
4 Persons	15.50	18.02	17.73	16.95
5 Persons	23.36	15.37	18.92	18.95
6+ Persons	30.82	16.78 *	8.87 *	19.22
All Households	17.23	19.19	11.71	16.05

(1) Based on averages which may be sensitive to extreme cases

* Caution: small sample size

**Calculated from the individual sample records rather than the averages shown in table

Source: Tabulated from Statistics Canada, 1992 FAMEX

2.9.7 Summary – Average RITPIR and Household and Locational Relationships

There appear to be some definable relationships in RITPIRs by household and locational characteristics, especially for income and household size (above one-person households) and for some types of households (couples with and without children). This is similar to the findings for the earlier average STIR analysis.

2.10 A MORE DETAILED LOOK AT RITPIRS CROSS-TABULATED BY TENURE

As with the STIRs, the various household and locational variables considered in Section 2.9

have been cross-tabulated by tenure (renters, owners with and without mortgages) to further explore the nature of any relationships with the RITPIRs.

2.10.1 Average STIRs by Tenure and Household Size

The stability that appears in average RITPIRs for all tenures combined for households with two or more persons (Section 2.9.1) carries over to households in this size group that are owners without mortgages for households but not necessarily to owners with mortgages or renters (see Figure 2-25). The six-plus size group shows a sharp decline for renters – but this could be due to sampling error. However, for renters with a household size of two to five persons, the

average RITPIRs are quite constant. There is a sharp unexplained drop in owners with mortgages with a household size of four persons, as well, which could reflect more variability in the housing acquisition years.

2.10.2 Average RITPIRs by Tenure and Household Composition

Individuals and single parents with more than one child have the lowest RITPIRs for each tenure group (see Figure 2-26). Also, the average RITPIR declines for couples by household size for both renters and owners with mortgages; for owners without mortgages, no clear pattern emerges.

2.10.3 Average RITPIRs by Tenure and Income Quintile

The direct relationship between RITPIRs and incomes for all households (Section 2.9.4) also applies to the three tenure groups (see Figure 2-27). For renters and owners with and without mortgages, the average RITPIR rises through the income quintiles from lowest to highest. In general, owners with mortgages have lower RITPIRs than either renters or owners without mortgages.

2.10.4 Average RITPIRs by Tenure and Area of Residence

Figure 2-28 shows that the pattern for all households of RITPIRs, being lowest in the largest urban centres and rural areas, also holds for each tenure group. However, the differences are the smallest for owners with mortgages.

2.10.5 Average RITPIRs by Tenure and Region

Figure 2-29 shows that British Columbia's low average RITPIR is all due to owners without mortgages. Further investigation shows that the British Columbia sample for owners without mortgages includes a large portion of single

parents with two or more children which would tend to decrease the average.

In addition, the lower RITPIR for renters is very much influenced by renters in Ontario and to a much lesser degree those in Manitoba/Saskatchewan.

2.11 IMPLICATIONS OF THE AVERAGE RITPIRS ANALYSIS FOR A VARIABLE STIR NORM FOR USE IN THE CORE HOUSING NEED MODEL

There is no question that household needs do vary, whether examined in terms of spending on just shelter or on all essentials. The question is how to formulate a scheme that can be supported on both conceptual and empirical grounds, which is clearly superior to the current fixed-STIR norm.

It would appear that income and household size are the variables offering the best prospects for the formulation of a variable-STIR scheme which takes into account spending on both shelter and non-shelter essentials – the same finding flowing from the average STIR analysis and the literature.

2.12 IMPLICATIONS OF FINDINGS FOR EXPLORING ALTERNATIVES TO THE FIXED 30-PERCENT STIR NORM

The primary messages from the analysis in this chapter are: There are convincing reasons for looking at options to the current fixed 30-percent STIR norm used in the Core Housing Need Model; there is support for a STIR norm that varies in some way with differences in household characteristics; and the choice of a specific STIR norm, whether a fixed STIR or a "base" STIR in a variable STIR (e.g., Steele and Mazikins) is judgemental. It is a question, then, of establishing a norm to reflect what is considered to be acceptable in Canada today.

Figure 2-26:

Average Residual Income by Tenure and Household Composition, Canada, 1992

Household Composition	Owners With Mortgages	Owners Without Mortgages	All Renters	All Households
<u>Average(1) Residual Income (Dollars)**</u>				
<u>Households with Heads Under Age 65</u>				
Individual	9,798	8,773	5,421	6,673
Couple/No Children	14,955	16,398	13,241	15,045
Couple/1 Child	15,858	22,334	9,958	17,244
Couple/2 Children	12,966	19,419	9,214	13,732
Couple/3+ Children	12,368	15,017	5,336	11,531
Single Parent/1 Child	7,231	11,701	4,369	6,981
Single Parent/2 Children	4,211	19	2,240	2,718
Single Parent/3+ Children	1,985	(5,498)	1,105	1,025
<u>Households with Heads Aged 65+</u>				
Individual	4,674	4,773	2,783	3,660
Couple	7,406	10,684	6,313	9,580
<u>All Other Households</u>	14,214	15,009	10,341	13,322
All Households	13,519	14,795	7,024	11,775
<u>Average(1) Residual Income As a Share of Pre-tax Income (Percent)</u>				
<u>Households with Heads Under Age 65</u>				
Individual	11.63	(11.64)	(5.25)	(3.67)
Couple/No Children	20.99	23.67	24.41	23.07
Couple/1 Child	19.14	14.61	20.00	17.60
Couple/2 Children	17.47	17.41	18.32	17.59
Couple/3+ Children	11.39	13.35	10.91	11.66
Single Parent/1 Child	12.54	21.04	12.77	15.01
Single Parent/2 Children	(1.51)	(21.44)	6.88	3.56
Single Parent/3+ Children	3.44	(6.44)	2.73	2.49
<u>Households with Heads Aged 65+</u>				
Individual	13.12	20.29	15.00	17.16
Couple	11.42	27.57	18.25	24.66
<u>All Other Households</u>	19.51	27.76	21.29	23.51
All Households	17.23	19.19	11.71	16.05

(1) Based on averages which may be sensitive to extreme cases

* Caution: small sample size

**Calculated from the individual sample records rather than the averages shown in table

Source: Tabulated from Statistics Canada, 1992 FAMEX

Figure 2-27:

Average Residual Income by Tenure and Income Quintile, Canada, 1992

Household Income Quintile	Owners With Mortgages	Owners Without Mortgages	All Renters	All Households
Average(1) Residual Income (Dollars)**				
Lowest	(4,286)	666	998	606
Second	1,502	5,643	4,477	4,409
Middle	5,551	10,640	9,045	8,582
Fourth	11,569	17,371	15,275	14,176
Highest	24,921	35,367	29,105	29,390
All Households	13,519	14,795	7,024	11,775
Average(1) Residual Income As a Share of Pre-tax Income (Percent)				
Lowest	(42.29)	(27.48) *	(8.74) *	(16.64) *
Second	4.24	22.57	17.55	17.17
Middle	13.75	27.39	23.09	21.87
Fourth	20.27	30.88	27.68	25.18
Highest	26.00	35.34	33.86	30.38
All Households	17.23	19.19	11.71	16.05

(1) Based on averages which may be sensitive to extreme cases

* Even though there is a small amount of positive residual income left on average for owners without mortgages and renters, some very negative cases result in negative ratios here.

**Calculated from the individual sample records rather than the averages shown in table

Source: Tabulated from Statistics Canada, 1992 FAMEX

Implications of the findings for the formulation of the variable-STIR options in the next chapter include:

- Two alternative options for the measurement of housing affordability should be examined: one that measures it in terms of shelter spending and income only, and another that looks at it in terms of overall spending on essentials (shelter and non-shelter) in relation to income.

There are two schools of thought implicit in the literature. The first looks at housing affordability in the narrower context of housing needs alone. The second looks at housing needs in terms of the overall spending needs of lower-income households.

- The most promising relationship to be explored is a scale based on household size and average STIR and RITPIR.

Household size shows up in the empirical work and the literature search as the household factor which warrants the most consideration as the variable in a variable-STIR norm. However, the very high average STIR and the negative RITPIR for one-person households suggest that some refinements may be required (such as the use of medians, rather than averages, as discussed in the next point).

The analysis also suggests that it may be necessary to combine the five-person and six-plus-person household groups in subsequent

Figure 2-28:

Average Residual Income by Tenure and Size of Area, Canada, 1992

Area of Residence (by Population)	Owners With Mortgages	Owners Without Mortgages	All Renters	All Household
<i>Average(1) Residual Income (Dollars)**</i>				
100,000+ Population	14,382	16,584	7,384	12,447
30,000-99,999	14,464	15,136	6,305	11,916
10,000-29,999	11,631	13,840	5,686	10,783
Rural	9,216	9,246	5,138	8,621
All Households	13,519	14,795	7,024	11,775
<i>Average(1) Residual Income As a Share of Pre-tax Income (Percent)</i>				
100,000+ Population	16.94	17.27	9.90	14.39
30,000-99,999	18.66	27.67	17.23	20.92
10,000-29,999	20.00	26.14	19.19	22.33
Rural	15.77	17.92	16.68	17.06
All Households	17.23	19.19	11.71	16.05

(1) Based on averages which may be sensitive to extreme cases

**Calculated from the individual sample records rather than the averages shown in table

Source: Tabulated from Statistics Canada, 1992 FAMEX

analysis. The FAMEX sample size is quite small for households with six or more persons, which in turn reflects the relative scarcity of these larger households in Canadian society. The data will need to be further assessed in the next stage of the analysis to determine whether combining these two groups will be necessary.

- Conducting subsequent analysis in terms of medians rather than averages should help to improve the quality of the results and reduce the effect of extreme values.

While the use of averages in the Chapter Two STIR analyses did not produce patterns by household characteristics much different than the use of medians did (Figure 2-11), the overall STIR levels are lower when measured by medians. Since extreme values play a larger role in the averages than the medians, it is concluded that subsequent analyses of

alternatives should consider the use of medians.

- Looking at STIRs and RITPIRs by tenure should provide added insight into spending/income relationships by household size.

Owners without mortgages with their relatively low shelter costs seem to be quite distinct from the other two tenure groups. There seems to be little doubt that the primary focus of housing affordability analysis should be on renters (there is precedent for this in the literature) since lower-income renters account for about three out of four households in core housing need nationally. Also, lower-income renters are the households with the greatest prima facie hardship since they are juggling their limited income among competing essential needs including shelter – their choices are limited.

Figure 2-29:
Average Residual Income by Tenure and Region, Canada, 1992

Region of Residence	Owners With Mortgages	Owners Without Mortgages	All Renters	All Households
Average(1) Residual Income (Dollars)**				
British Columbia	14,026	13,201	6,195	11,354
Alberta	15,351	16,950	7,393	13,302
Manitoba/ Saskatchewan	11,958	12,643	6,582	10,895
Ontario	14,361	16,753	8,161	13,181
Quebec	11,597	12,178	5,712	9,460
Atlantic	12,499	11,659	6,136	10,415
All Households	13,519	14,795	7,024	11,775
Average(1) Residual Income As a Share of Pre-tax Income (Percent)				
British Columbia	19.38	(8.72)	13.65	5.53
Alberta	17.53	22.15	18.36	19.52
Manitoba/ Saskatchewan	19.20	26.56	10.82	20.30
Ontario	16.95	24.00	6.66	16.06
Quebec	16.46	22.11	16.53	18.27
Atlantic	19.66	25.07	17.96	21.48
All Households	17.23	19.19	11.71	16.05

(1) Based on averages which may be sensitive to extreme cases

**Calculated from the individual sample records rather than the averages shown in table

Source: Tabulated from Statistics Canada, 1992 FAMEX

Owners with mortgages, as a general rule, tend to be in a different position than renters, most notably lower-income renters, since they have made a conscious decision to buy a home and incur mortgage debt; at the time of purchase, they make a choice of how much of their income to devote to shelter in order to buy a home. Thus, these households provide some guidance about how much of their income households that have a choice are prepared to devote to shelter. This experience may have potential in helping to determine the specific shape of a variable-STIR scale.

- Both a narrower and broader concept of "essentials" should be considered in choosing

between potential alternatives for looking at affordable shelter needs within overall spending on essentials and income.

The literature documents two distinct concepts of what constitutes "essentials." Making a choice between the two should be given due consideration in the analysis of alternative variable STIRs. The first is a narrower concept of essentials, best exemplified by Statistics Canada's Low-Income Cut-Offs. The second is a broader concept, best typified by the Mazikins-Runge approach.

- The analysis of variable-STIR options need not allow for locational variations.

The general similarity found among average STIR and average RITPIRs by size of area and by region suggests that locational variations need not be incorporated into the variable-STIR options to be considered in Chapter Three. This finding is reinforced by the fact that geographic variations in shelter costs are already imbedded in the means test for Core Housing Need.

CHAPTER THREE – EXPLORING ALTERNATIVE VARIABLE-STIR MEASURES

This chapter highlights the research in which alternative STIR measures are explored, and a practical methodology is developed for varying the STIR so that households with different characteristics and non-shelter needs will be treated equitably – or more equitably than with a 30-percent fixed STIR. The chapter draws heavily on the empirical work carried out in Chapter Two as well as the guidance available from the literature review and the earlier attempts at creating a variable STIR by Steele, Mazikins and Runge.

3.1 THE NEED TO DEVELOP AN ALTERNATIVE TO THE 30-PERCENT FIXED STIR

Chapter Two showed that the present 30-percent fixed-STIR criterion for determining housing need is not backed up by an examination of the empirical household data from the population at large.

However, a 30-percent criterion is being used in at least two other applications:

- It sets the qualifying income for mortgage approval in some instances.

In this case, the expectation is that over time the economic circumstances of the borrower will improve. A new mortgagor is also expected, being young and having a family in most cases, to be carrying other debt. A 30-percent STIR allows room for those other requirements.

- It is used for calculating the rent for those in assisted housing.

Here, incomes are generally low and 30 percent of income does not cover the economic rent. The 30 percent is set to provide a contribution to the operation of the project and entails a large subsidy, the

purpose of which is to assist the household to ready itself to return to the private market. It is expected that the household's length of stay in assisted housing will be limited.

The fact of the matter is that identifying those in housing need is very different from either of the above two applications. The rationales justifying use of the 30-percent criterion in the cases above do not necessarily apply to the determinants of housing need. Given this and the lack of empirical household data support for use of the 30-percent criterion to measure need, it is appropriate to develop alternative affordability measures which better recognize that households differ in their circumstances and life stages.

3.2 THE CRITERIA FOR A VARIABLE STIR

There are several criteria that should be used to develop any variable STIR:

- It must be practical – that is, readily understood and able to be administered;
- It needs to be empirically grounded, and easily calculated and updatable from readily available information;
- It must take account of equity issues;
- It should consider that a household has to meet both housing and other expenditures; and
- It must be neutral, in that it does not encourage any given form of household organization or discriminate against others.

3.3 HOUSEHOLD SIZE AS A BASIS FOR A VARIABLE STIR

In the empirical analysis discussed in Chapter Two, it was hoped that signs of

a variable STIR would be evident in the data. Several socio-economic dimensions were included in the analysis, including type of household, size, income, region, and size of settlement.

Income was, of course, shown to be inversely related to a STIR. Lower-income households must pay a larger share of their income for shelter since they compete in the same housing market as higher-income households.

Type of household is a composite variable, since it encompasses size, family and life cycle stage; however, because of its complexity, it is difficult to analyze its effect on the variation in the observed STIRs.

The size of settlement seemed to embody the variation resulting in the differing tenure mix. The regional variable had relatively little effect. In any event, the search focused on finding a national standard which could be applied across the country. Regional differences are accommodated at the second stage of the housing needs test, which sets the income limits for need qualification. These are market-sensitive and as such are designed to account for housing-cost differentials due to region and settlement size.

Consideration also had to be given to the possibility that a variable STIR could be seen as discriminatory if it were based on factors over which the household had no control or even were explicitly forbidden under Human Rights Legislation (e.g., age). The one factor that can be considered as 'neutral' is size of household.

A variable STIR should not be designed so as to favour a given form of household organization. Nonetheless, it can take into account the possibility that, with economies of scale, a certain size of household is more efficient in its use of housing resources. Mazikins and Steele both opted for size of household as the dimension on which to base the STIR (refer to Section 2.7.2).

Given the existence of household economies of scale, the neutrality of those economies with

respect to potential discriminatory issues, and research by Mazikins and Steele, household size appears to be the most appropriate variable to use as a basis for formulating a variable STIR.¹²

3.4 THE CHOICE OF A DATA BASE

The variable STIR should be based on FAMEX since this is the only data base which matches expenditures and incomes in the same year. It is used for basing and weighting the Consumer Price Index (CPI). As such, it is conducted regularly on a large national sample and would be available for updating the STIR.

3.5 USE OF MEDIANS RATHER THAN AVERAGES

As discussed in Section 2.12, the analysis here is conducted in terms of medians rather than averages, in order to reduce the effect of extreme values.

While the use of averages in the Chapter Two STIR analyses did not produce patterns by household characteristics much different than the use of medians did (Figure 2-11), the overall STIR levels are lower when measured by medians. Since extreme values play a larger role in the averages than the medians, it was concluded that the analyses of alternative variable STIRs should be based on medians.

3.6 THE DIRECT AND INDIRECT APPROACHES TO FORMULATING A VARIABLE STIR

As concluded in Section 2.12, two alternative options for the measurement of housing affordability are to be examined:

- One which measures housing affordability in terms of shelter costs and income **only** and has its basis in the empirical analysis conducted in Chapter Two; this approach is referred to hereafter as the **direct approach**; and

- Another which looks at housing affordability in terms of overall spending on essentials (shelter and non-shelter) in relation to income, and has its basis in the earlier work of Steele and Mazikins; this approach is hereafter referred to as the **indirect approach**.

Based on the shelter/non-shelter classification, Mazikins developed a method which followed the indirect approach. To establish a base for his method, Mazikins retained 30 percent as the STIR for a two-person household. By imposing this as the norm, he really pre-determined the level (if not the slope) of the scale for the other household sizes. The work here does not impose this type of restriction in advance.

Setting a threshold to measure housing affordability (be it 30 percent or some other level) entails some debate since it is judgemental and normative in nature. In the direct approach, agreement must be reached on the level of income to be spent on shelter. In comparison, the indirect approach also requires agreement on what goods and services are to be included in the non-housing bundle as well as what share of income should be spent on them, as well as the housing STIR itself. So the indirect approach can tend to complicate the question rather than simplify it. The indirect approach may be viewed by some as giving primacy (or at least equal weight) to non-shelter expenses.

And, whatever affordability threshold is set, it needs to consider the fact that a shelter cost-to-income ratio is also used to establish rent for assisted housing. Any variable STIR should be reasonably close to the latter since there are horizontal equity reasons for not setting the need criterion too different from the rent determination level. In the following sections, alternative variable STIRs based on household size are explored using first the direct, then the indirect, approaches.

3.6.1 The Direct Approach

Under the direct approach two options are considered: Method 1A which encompasses all households, and Method 1B which excludes homeowners without mortgages.

In the direct approach (Method 1A), median STIRs are calculated for households by size (as was shown in Figure 2-11) and smoothed to the nearest percentage point (Figure 3-1).¹³ The STIR is highest for one-person households, and declines as household size increases.

As was observed in Figure 2-11 in Chapter Two, in the population as a whole the median STIRs are well below 30 percent. This makes sense since the population as a whole is not expected to have an affordability problem.

The challenge, therefore, is to set the gap between the population statistic and the point at which affordability is defined to become a problem. Statistics Canada faced a similar task problem when setting the low-income lines using the new method known as the Low Income Measure (LIM).¹⁴ After extensive study, Statistics Canada decided upon 50 percent as the appropriate gap between median-income and the low-income level. This same gap has been adopted here to maintain consistency with the low-income research undertaken by Statistics Canada. In the case of income, clearly lower is worse; for STIRs, higher is worse. Figure 3-1 shows the variable STIR resulting after adding 50 percent to the smoothed median STIR, and rounding it to the nearest percentage point.

Figure 3-1 is based on all households, regardless of tenure. However, a case can be made for excluding owners without mortgages. The other two groups of households – owners with mortgages and renters – can be seen as buying shelter services at prevailing prices. Owners without mortgages, on the other hand, are reaping the benefit of past payments of principal which have lowered their current outlays.

Figure 3-1: Median Shelter Cost-to-Income Ratio by Size of Household, Direct Approach (1A) Canada, 1992

Size of Household	Median STIR		Smoothed Median STIR Plus 50%
	Unadjusted	Smoothed (Percent)	
1 Person	23.63	24.00	36.00
2 Persons	20.68	21.00	32.00
3 Persons	17.32	17.00	26.00
4 Persons	16.85	17.00	26.00
5 Persons	16.50	17.00	26.00
6+ Persons	15.28	15.00	23.00

Source: Based on Figure 2-11

Figure 3-2 shows the effect of excluding owners without mortgages (Method 1B). In general, the STIRs are increased, although the degree varies by household size. As well, the gap between the STIRs for smaller and larger households has narrowed, and the two-person household now has approximately the same STIR as the one-person household.

Removing owners without mortgages will largely remove older couples from the group. The couples remaining, i.e., those with mortgages, will tend to be younger and more likely to have two

incomes. Figure 3-2 demonstrates their ability to pay more for their housing. The non-housing expenditure analysis to follow (in Section 3.4.2) will confirm their capacity to do so.

Note that median STIRs decline by household size until the six-plus-person household, at which point they spike upward. These large households constitute a small percentage of the population and, as such, often exhibit contradictory results. In this case, they have a higher median STIR than households in the next smallest size category.

Figure 3-2: Median Shelter Cost-to-Income Ratio by Size of Household, Direct Approach (1B) Excluding Owners Without Mortgages Canada, 1992

Size of Household	Median STIR		Smoothed Median STIR Plus 50%
	Unadjusted	Smoothed (Percent)	
1 Person	25.40	25.00	38.00
2 Persons	24.50	25.00	38.00
3 Persons	21.40	21.00	32.00
4 Persons	20.70	21.00	32.00
5 Persons	20.40	20.00	30.00
6+ Persons	22.30	22.00	33.00

Source: Tabulated from Statistics Canada, 1992 FAMEX

3.6.2 The Indirect Approach

Figure 3-3 outlines the series of steps required for the calculation of the indirect variable STIR; a discussion of the process is provided below.

In the indirect approach to the formulation of a variable STIR (referred to as Method 2), account is taken of non-shelter essentials (e.g., food, clothing) as well as shelter. This requires a decision as to what should be included in the essentials bundle, in addition to housing.

There are two concepts of "essentials" that appear in the literature (refer to Section 2.12):

- **Narrow concept.** This concept of essentials includes only food, personal taxes and clothing in addition to shelter, and is used by Statistics Canada for its Low-Income Cut-Offs;
- **Broad concept.** In addition to the above, this definition includes personal care, household operation, health care and transportation costs to cover most of the obligations of the average household; it is the concept used by Mazikins and Runge.

But how much does a household need for these items? Among the population, there will be variations representing quality, choice, luxury items, etc. Also, there may be some economies of scale for larger households.

To account for these latter differences, the concept of an adjusted per capita expenditure is used here. The Statistics Canada Low Income Measure (LIM) methodology was used as a guide. In this approach, a household's requirement for income is not considered to be simply a multiple of the number of persons in the household. Instead, a weighting schema, based on household size and composition, is used. On this scale, Person 1 (i.e., the reference adult in the household) is assigned a weight of 1, and any other adults a weight of 0.4. Children are given a weight of 0.3, except for the first child in a one-adult family, who would get a weight of 0.4.

Figure 3-3:
Steps in the Formulation of an Indirect Variable Stir

- Determine total expenditures by **each** household for non-shelter essentials
- Determine the adjusted number of people in **each** household using Statistics Canada's weighting schema
- Calculate the adjusted per capita expenditure on non-shelter essentials for **each** household
- Establish the median adjusted per capita expenditure for the non-shelter essentials for **all** households
- Assign a total budget for non-shelter essentials to **each** household by multiplying the median per capita expenditure by the adjusted number of persons in that household
- Calculate residual household income by subtracting the total budget for non-shelter essentials from the total income for **each** household
- Calculate the median of this residual income for shelter and discretionary spending as a portion of the household income for households of **different sizes**
- Derive the Indirect Variable STIR for households of different sizes by subtracting 10 percentage points from the residual income medians by household size

This weighting schema is used here to calculate the adjusted per capita expenditure on non-shelter essentials using both the broad and narrow definitions of essentials. The steps in the process shown in Figure 3-3 can be summarized as follows:

- First, the expenditures by each household for non-shelter essentials (using both definitions) are determined.
- Second, the adjusted number of people for each household is arrived at using the weighting schema. The adjusted number is always less than the actual number of people in the household except in the case of the one-person household, where it is the same.
- Third, an adjusted per capita expenditure on non-shelter essentials is calculated for each household by dividing the total household expenditures on non-shelter essentials by the adjusted number of people in the household. Then, the median adjusted per capita expenditure is obtained for non-shelter essentials for all households.

This all-household median per capita non-shelter expenditure is adopted as the suitable building block for setting a theoretical budget that would be sufficient for any household's needs. Since half of the population spend less than this amount, it can be regarded as sufficient to cover basic needs.¹⁵

A theoretical budget for basic non-shelter essentials is calculated for every household using its adjusted number of persons. This theoretical

household non-shelter budget is then subtracted from total household income to determine what residual income would be left for non-essential expenditures and for housing. The median percentages of this remaining income are then calculated by household size. As shown in Figure 3-4, these median percentages become the basis for developing the variable STIR in this indirect approach.

While the calculation may seem complex, the logic behind the methodology is based on several underlying principles:

- Households have a need for income for everyday living but there is no scientific way to assign a precise amount to each household to satisfy its needs;
- The amount each household will spend in practice will vary according to taste, circumstance and many other factors;
- Using a standardized method to arrive at per capita expenditure on non-shelter essentials will abstract from many of the variables that cause inter-household variation.
- Allowing each household this level of expenditure for non-shelter essentials resembles the budget approach used by

Figure 3-4: Median Shelter Cost-to-Income Ratio by Size of Household, Indirect Approach (2) Canada, 1992

Size of Household	Residual Income After Non-Shelter Essentials			Broad Smoothed Minus 10 Per- centage Points
	Broad	Narrow	Broad Smoothed (Percent)	
1 Person	48.09	65.31	48.00	38.00
2 Persons	48.46	66.48	48.00	38.00
3 Persons	44.35	64.68	44.00	34.00
4 Persons	44.26	63.60	44.00	34.00
5 Persons	40.88	60.67	41.00	31.00
6+ Persons	41.55	62.83	41.00	31.00

Source: Tabulations based on Statistics Canada, 1992 FAMEX

agencies such as the Montreal Diet Dispensary and the Toronto Social Planning Council, except the level of the expenditure requirement assigned here is empirically based on observed expenditures over the entire population rather than assigned by a panel of experts; and

- Using the FAMEX data to arrive at the median level of expenditure on non-shelter essentials makes the method empirically based and hence less arbitrary or prescriptive. In other words, the allotted household expenditure is based on observed expenditures by households rather than some notional basket of goods.

The first column of Figure 3-4 shows the proportion of median income remaining by household size after each household has spent the median adjusted amount on the broadest range of non-shelter essentials. The second column uses the fewer expenditure categories of the narrow concept of essentials.

For deriving the variable STIR under the indirect approach, the broad concept of essentials is chosen so that the analysis would not be seen to be advocating that households forego essential consumption which could potentially cause undue hardship.

Households will not be able to spend all of the income after their basic non-shelter requirements on shelter; some portion must be left over for discretionary spending. The question is: How much? Unfortunately, there is no guidance in the literature on this point.

The figure used here over and above the broadest definition of essentials is 10 percent; this was derived after an examination of residual income information in Chapter Two. Two considerations were taken into account:

- Figure 2-27 showed that the average residual income for all households was 16.05 percent. The LIM sets 50 percent as the gap between the population statistic and the "problem"

level. Statistics Canada has found some justification for this in both the academic literature and 1984 CCSD poverty guidelines. Taking 50 percent of the average residual income for all households would result in 8 percent being the "problem threshold." This allowance could be too low, however, as Figure 2-27 shows that the lowest quintile has negative residual incomes on average, which arise because of some extreme values.

- If, instead of looking at the residual income for all households, one were to look at that for the middle income quintile only, the average residual income is 21.87 percent. Housing affordability problems largely disappear at this income level. One half of 21.87 percent would be approximately 11 percent.

The two methods above established a range of between 8 and 11 percent for discretionary spending – the chosen 10 percent is towards the upper end of that range.

The right-hand column in Figure 3-4 shows the variable STIR which would result after the smoothed broad calculation of the proportion of income remaining after accounting for expenditures on non-shelter essentials is reduced by 10 percentage points (referred to as Method 2).

Like Method 1B, the one- and two-person households under Method 2 have similar STIRs. This could be the result of the fact that the second adult often brings along a second income without doubling the need for expenditure. Figure 2-5 showed that little of the increased income of the two-person household was spent on housing, thereby resulting in a lower average STIR. This could be interpreted as evidence of an additional capacity of two-person families to pay more for their housing while maintaining the same level of welfare as the single individual.

This is further confirmed when looking at the higher STIR of couples either renting or owners with mortgages who choose to pay higher STIRs. The LIM approach indicates that the additional person adds only 0.4 of the need of the first

Figure 3-5:
Summary of Median Shelter Cost-to-Income Ratios by Size of Household, Various Approaches
Canada, 1992

Size of Household	Direct Approach		Indirect Approach		
	1A	1B	2 (Percent)	Mazikins	Steele
1 Person	36	38	38	35	40
2 Persons	32	38	38	30	30
3 Persons	26	32	34	28	25
4 Persons	26	32	34	27	22.5
5 Persons	26	30	31	27	20
6+ Persons	23	33	31	25	20

Source: Figures 3-1, 3-2, 3-4 and Boriss Mazikins, *Assessment of a Variable Cost-to-income Measure of Affordability*, CMHC, Research Division, 1992 and Marion Steele, *Canadian Housing Allowances: An Economic Analysis*, Ontario Economic Council, 1985

person to the household's total needs (see Section 3.6.2). From an equity viewpoint, there is little justification for asking two adults to spend less of their income on shelter than one adult, particularly given the evidence of the two-person household's additional capacity to pay.

A noteworthy point about this approach is that it suggests that there is some income room to increase the present STIR. The STIR scale is also based on size and type of household since it takes into account the existence of children. Since we have shown that there is ample income to cover all essentials even under the broad concept, plus a cushion of 10 percent for discretionary spending, it can be argued that undue hardship would not result from increasing the STIRs.

3.7 SUMMARY OF THE ALTERNATIVE APPROACHES AND IMPLICATIONS FOR THE SUBSEQUENT ANALYSIS

The variable-STIR approach presented in this report is for the delineation of housing need only. Some may consider its applicability as a rental scale for households in assisted housing. If it were used in that way, and that was not considered as part of this project, households would be assessed

a certain percentage of their current income only if it were positive. The issue of negative residual income, dealt with at some length in Chapter 2, would then be moot.

Three alternative variable STIRs have been developed in this chapter – two based on direct calculation (Methods 1A and 1B) and one based on indirect inference from other expenditures (Method 2). The three resulting variable STIRs are presented in Figure 3-5, along with the STIRs derived by Mazikins and Steele. Highlights include:

- The STIRs developed in this chapter meet all of the key criteria outlined in Section 3.2:
 - They are practical, in that they are relatively straightforward to understand and implement;
 - They are equitable, since they treat all households the same, regardless of age or lifecycle stage;
 - They are based on both shelter and other expenditures;
 - They are empirically grounded (being derived from FAMEX data) and can be updated as new survey results become available; and

- They are also neutral in that they do not encourage a given form of household organization or discriminate against others.
- As can be seen from Figure 3-5, there is little variation between the STIRs developed using Methods 1B and 2. These STIRs do, however, vary from the STIRs developed using Method 1A and from those of Mazikins and Steele, in that the decline in the STIR as household size increases is less pronounced. This difference reflects the different methods used.

In the next chapter, two of these variable STIRs are selected to test on the 1991 Core Housing Need Database. In order to allow for a contrast, direct approach Method 1A (which included all tenures) and the indirect approach (Method 2) will be compared to the present method of measuring core housing need using a 30-percent fixed STIR.¹⁶

Sensitivity analyses will identify the impact of the direct and indirect approaches on the fabric of core housing need, paying particular attention to the tenure and household composition of households in need. Basic housing counts by above/below the affordability thresholds and core need status will be presented for each of the methods.

CHAPTER FOUR – ESTIMATING THE NUMBERS OF HOUSEHOLDS IN NEED UNDER ALTERNATIVE APPROACHES

In this final third phase of the research, estimates of households in housing need derived using the variable-STIR approaches 1A and 2 developed in Chapter Three are compared and contrasted with estimates of households in housing need based on the fixed STIR of 30 percent currently in use.

4.1 SELECTION OF STIRs TO TEST AND CHOICE OF DATA BASE

The variable STIRs derived using the direct approach (1A) and the indirect approach (2) in Chapter Three are used for the test. These two STIR measures were shown previously in Figure 3-5. The direct approach, Method 1B (which excluded owners without mortgages), is not used here, as the STIRs obtained under this method are very similar to those produced under the indirect approach (Method 2) and would therefore produce similar numbers of households in need.

While the FAMEX data base was used to develop the variable-STIR approaches, estimates of households in need using these approaches are determined using the 1991 Core Housing Need Database, for the following reasons:

- The Core Housing Need Database also contains variables on housing quality, so that adequacy and suitability problems can also be examined; and
- The Core Housing Need Database is based on data from Statistics Canada's Household Income, Facilities and Equipment (HIFE) micro-data base, which provides a much larger sample than FAMEX,

and thereby facilitates more detailed analysis of core housing need.

4.2 HOUSEHOLDS IN NEED UNDER THE DIFFERENT APPROACHES

4.2.1 The Direct Approach

Figure 4-1 compares the number of households spending more than the affordability threshold under the direct approach (1A) variable STIR and the present 30-percent fixed STIR.

The total number of households spending more than the norm is similar in each case – just over 1.7 million. However, there are 244,000 households that are above the 30-percent fixed-STIR affordability threshold that fall below the direct approach affordability threshold, and 241,000 households that are above the direct approach threshold but below the 30-percent fixed-STIR threshold. Therefore, while the direct approach does not reduce the number of households in affordability need, it does change the composition of about 15 percent of the households that qualify.

Figure 4-1:
Number of Households Spending More than the Affordability Threshold, Direct Approach (1A) Variable STIR Compared to 30 Percent Fixed STIR, Canada, 1991

	Direct Approach (1A)		Total Households
	Above Threshold	Below Threshold (Households)	
30 Percent Fixed STIR			
Above Threshold	1,475,000	244,000	1,719,000
Below Threshold	241,000	7,615,000	7,856,000
Total Households	1,716,000	7,859,000	9,574,000

Source: CMHC 1991 Core Housing Need Database, developed from the Statistics Canada Household Income, Facilities and Equipment (HIFE) and Shelter Cost Survey (SCS) microdata tape, 1991, enhanced to facilitate calculations for core housing need.

Figure 4-2:
Number of Households Spending More than the Affordability Threshold, Indirect Approach (2) Variable STIR Compared to 30 Percent Fixed STIR, Canada, 1991

	Indirect Approach (2)		
	Above Threshold	Below Threshold (Households)	Total Households
30 Percent Fixed STIR			
Above Threshold	1,177,000	541,000	1,719,000
Below Threshold	0	7,856,000	7,856,000
Total Households	1,177,000	8,397,000	9,574,000

Source: CMHC 1991 Core Housing Need Database, developed from the Statistics Canada Household Income, Facilities and Equipment (HIFE) and Shelter Cost Survey (SCS) microdata tape, 1991, enhanced to facilitate calculations for core housing need.

at the second stage of the core need analysis, since a higher STIR means that it takes a lower income to support a given shelter outlay. Thus, in addition to the higher STIR at stage one resulting in fewer households spending more than the norm, the lower Core Need Income Threshold at the second stage further reduces the number of households in overall need. Figure 4-3 shows the number in core need under both the present 30-percent fixed STIR and the two alternative variable STIRs.

The table shows that while the number of households in

core need is lower under both variable STIRs than under the 30-percent fixed STIR, it is significantly lower in the case of the indirect approach variable STIR.

4.2.2 The Indirect Approach

In the case of the indirect approach to measuring affordability, where all of the STIR categories are above the present 30-percent cut-off, one would expect that it would have a more marked effect on reducing the number of households than would the direct approach – and it does.

As shown by Figure 4-2, the indirect approach classifies some 31 percent fewer households as spending more than the norm than does the current fixed 30-percent affordability threshold. The indirect approach reduces the number of households spending more than the norm on shelter by over half a million – from just over 1.7 million to less than 1.2 million.

4.2.3 National Estimates of Core Need

Not all of the households identified above as spending more than the affordability threshold are in core housing need, since they also have to be below the Core Need Income Threshold.

Using a higher STIR to measure affordability automatically produces a lower-income threshold

4.2.4 Estimates of Core Need by Province

Figure 4-4 shows the breakdown of the core need estimates by province under each of the three approaches.

In each province, the incidence of need is by far lower under the indirect approach than either the fixed 30-percent STIR or the direct approach.

For most cases, estimates of need under the direct approach are lower than for the 30-percent fixed STIR; the exceptions are Alberta, where slightly higher numbers of households in core need are obtained under the direct approach than the 30-percent fixed STIR and Newfoundland where the estimates are the same.

An examination of the provincial distributions of households in core need in Figure 4-4 indicates that there are only marginal differences across all three approaches in the location of need.

Figure 4-3

Comparison of Number of Households in Core Need Under Alternative Approaches, Canada, 1991

	30 Percent Fixed STIR	Variable STIR	
		Direct Approach (1A)	Indirect Approach (2)
Number of Households in Core Need	1,164,000	1,082,000	806,000
% of All Households	12.2	11.3	8.4

Source: CMHC 1991 Core Housing Need Database, developed from the Statistics Canada Household Income, Facilities and Equipment (HIFE) and Shelter Cost Survey (SCS) microdata tape, 1991, enhanced to facilitate calculations for core housing need.

Figure 4-4

Comparison of Households in Core Need by Province Under Alternative Approaches, Canada, 1991

Province	30% Fixed STIR			Direct Approach (1A)			Indirect Approach (2)		
	Number	Incidence	% of Total	Number	Incidence	% of Total	Number	Incidence	% of Total
Newfoundland	20,000	11.4	1.7	20,000	11.4	1.8	13,000	7.8	1.7
Prince Edward Island	7,000	14.4	0.6	7,000	14.3	0.6	5,000	10.0	0.6
Nova Scotia	45,000	14.0	3.8	44,000	13.7	4.0	32,000	10.1	4.0
New Brunswick	28,000	11.2	2.4	27,000	10.7	2.5	19,000	7.6	2.3
Quebec	341,000	13.3	28.3	298,000	11.6	27.5	232,000	9.0	28.8
Ontario	389,000	11.2	33.4	364,000	10.5	33.7	268,000	7.7	33.2
Manitoba	41,000	10.8	3.5	38,000	10.2	3.5	30,000	7.9	3.7
Saskatchewan	37,000	10.7	3.2	34,000	10.0	3.2	27,000	7.9	3.4
Alberta	94,000	10.9	8.1	100,000	11.6	9.2	71,000	8.2	8.8
British Columbia	164,000	14.0	14.1	152,000	13.0	14.0	110,000	9.4	13.6
Total	1,164,000	12.2	100.0	1,082,000	11.3	100.0	806,000	8.4	100.0

Source: CMHC 1991 Core Housing Need Database, developed from the Statistics Canada Household Income, Facilities and Equipment (HIFE) and Shelter Cost Survey (SCS) microdata tape, 1991, enhanced to facilitate calculations for core housing need.

4.2.5 Estimates of Core Need by Selected Household Characteristics

Figures 4-5 through 4-9 provide further comparisons of the estimates of housing need generated by the present 30-percent fixed-STIR approach to determining core housing need with those derived by the two variable-STIR approaches. Key highlights include:

- As expected, changing from a fixed affordability threshold to one that diminishes with increases in household size under the variable-STIR approaches results in greater proportions of households in housing need being larger households. The direct approach results in about 35 percent of the households in need being three persons or more, compared to about 25 percent with a 30-percent fixed STIR (Figure 4-5). The indirect approach also increases the proportion of need constituted by households of three persons or more, though much less so.
- The direct approach includes relatively more families with children (both two-parent and single-parent households) and fewer seniors

Figure 4-5

Comparison of Number of Households in Core Need by Size of Household Under Alternative Methods, Canada, 1991

Size of Household	30% Fixed STIR			Direct Approach (1A)			Indirect Approach (2)		
	Number	Incidence	% of Total	Number	Incidence	% of Total	Number	Incidence	% of Total
1 Person	616,000	27.4	52.9	474,000	21.0	43.8	419,000	18.6	52.0
2 Persons	263,000	8.9	22.6	230,000	7.8	21.2	158,000	5.4	19.7
3 Persons	150,000	8.8	12.9	186,000	10.9	17.2	115,000	6.7	14.2
4 Persons	74,000	4.3	6.4	98,000	5.7	9.0	56,000	3.3	6.9
5 Persons	47,000	6.9	4.1	68,000	9.9	6.3	44,000	6.4	5.5
6+ Persons	14,000	5.4	1.2	27,000	10.2	2.5	13,000	5.0	1.6
Total	1,164,000	12.2	100.0	1,082,000	11.3	100.0	806,000	8.4	100.0

Source: CMHC 1991 Core Housing Need Database, developed from the Statistics Canada Household Income, Facilities and Equipment (HIFE) and Shelter Cost Survey (SCS) micro-data tape, 1991, enhanced to facilitate calculations for core housing need.

Figure 4-6

Comparison of Number of Households in Core Need by Household Composition Under Alternative Methods, Canada, 1991

Household Composition	30% Fixed STIR			Direct Approach (1A)			Indirect Approach (2)		
	Number	Incidence	% of Total	Number	Incidence	% of Total	Number	Incidence	% of Total
Individual	351,000	20.9	31.0	314,000	18.2	29.0	275,000	16.0	34.1
Couple	80,000	5.4	6.9	66,000	4.4	6.1	45,000	3.0	5.6
Family - Children	138,000	3.8	11.9	205,000	5.7	19.0	110,000	3.0	13.7
Single Parents	215,000	34.7	18.5	220,000	36.4	20.3	165,000	26.6	20.5
All Others	34,000	15.1	3.0	36,000	15.6	3.3	23,000	10.2	2.9
Seniors	335,000	17.7	28.8	242,000	12.7	22.3	187,000	9.9	23.3
Total	1,164,000	12.2	100.0	1,082,000	11.3	100.0	806,000	8.4	100.0

Source: CMHC 1991 Core Housing Need Database, developed from the Statistics Canada Household Income, Facilities and Equipment (HIFE) and Shelter Cost Survey (SCS) micro-data tape, 1991, enhanced to facilitate calculations for core housing need.

Figure 4-7

Comparison of Number of Households in Core Need by Household Income Quintile Under Alternative Methods, Canada, 1991

Household Income Quintile	30% Fixed STIR			Direct Approach (1A)			Indirect Approach (2)		
	Number	Incidence	% of Total	Number	Incidence	% of Total	Number	Incidence	% of Total
Lowest	981,000	54.7	84.2	875,000	48.8	80.9	735,000	41.0	91.2
Second	183,000	9.4	15.7	188,000	9.7	17.4	71,000	3.6	8.8
Middle	0	0.0	0.0	19,000	1.0	1.7	0	0.0	0.0
Fourth	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
Highest	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
Total	1,164,000	12.2	100.0	1,082,000	11.3	100.0	806,000	8.4	100.0

Source: CMHC 1991 Core Housing Need Database, developed from the Statistics Canada Household Income, Facilities and Equipment (HIFE) and Shelter Cost Survey (SCS) micro-data tape, 1991, enhanced to facilitate calculations for core housing need.

Figure 4-8

Comparison of Number of Households in Core Need by Household Tenure Under Alternative Methods, Canada, 1991

Household Tenure	30% Fixed STIR			Direct Approach (1A)			Indirect Approach (2)		
	Number	Incidence	% of Total	Number	Incidence	% of Total	Number	Incidence	% of Total
Renters	849,000	24.9	72.9	774,000	22.7	71.6	613,000	18.0	78.1
Owners With Mortgages	133,000	4.5	11.5	151,000	5.1	14.0	87,000	2.9	10.9
Owners Without Mortgages	182,000	5.7	15.6	157,000	4.9	14.5	106,000	3.3	13.1
Total	1,164,000	12.2	100.0	1,082,000	11.3	100.0	806,000	8.4	100.0

Source: CMHC 1991 Core Housing Need Database, developed from the Statistics Canada Household Income, Facilities and Equipment (HIFE) and Shelter Cost Survey (SCS) micro-data tape, 1991, enhanced to facilitate calculations for core housing need.

Figure 4-9

Comparison of Number of Households in Core Need by Size of Area of Residence Under Alternative Methods, Canada, 1991

Size of Area of Residence	30% Fixed STIR			Direct Approach (1A)			Indirect Approach (2)		
	Number	Incidence	% of Total	Number	Incidence	% of Total	Number	Incidence	% of Total
100,000+Population	785,000	13.4	67.4	733,000	12.5	67.7	554,000	9.5	68.8
<100,000	252,000	11.8	21.6	220,000	10.3	20.3	166,000	7.8	20.7
Rural	127,000	8.1	10.9	129,000	8.2	12.0	85,000	5.4	10.6
Total	1,164,000	12.2	100.0	1,082,000	11.3	100.0	806,000	8.4	100.0

Source: CMHC 1991 Core Housing Need Database, developed from the Statistics Canada Household Income, Facilities and Equipment (HIFE) and Shelter Cost Survey (SCS) micro-data tape, 1991, enhanced to facilitate calculations for core housing need.

and individuals in housing need (Figure 4-6). While the indirect approach similarly increases the proportion of households in need composed of families, it also increases the portion that are individuals, and decreases the portion that are couples and seniors.

- Income-wise, the proportion of households in need in the second quintile goes up under the direct approach while the indirect approach results in by far the most targeted population of households in need, with over 90 percent in the first quintile (Figure 4-7).
- The direct approach results in a larger proportion of households in need being owners with mortgages than under the 30-percent fixed STIR (Figure 4-8); in the indirect approach, housing need shifts towards renters.

- In terms of the geography of housing need, moving from the 30-percent fixed STIR to either of the variable STIRs makes relatively little difference to the distribution of need by size of settlement (Figure 4-9).

4.2.6 Average Income and Shelter Costs of Households in Need

Figures 4-10 through 4-13 show the average incomes, shelter costs and STIRs of households in core need under each of the three approaches by selected household characteristics.

Highlights include:

- Overall, relative to the 30-percent fixed-STIR approach, average incomes are higher under the direct approach, but lower under the indirect approach (Figure 4-10).

Figure 4-10

Average Incomes and Shelter Costs of Households in Core Need by Region Under Alternative Approaches, Canada, 1991

Province	30% Fixed STIR			Direct Approach (1A)			Indirect Approach (2)		
	Shelter			Shelter			Shelter		
	Income Dollars	Cost	STIR Percent	Income Dollars	Cost	STIR Percent	Income Dollars	Cost	STIR Percent
Newfoundland	11,770	3,493	32.5	12,536	3,561	32.1	10,469	3,398	35.5
Prince Edward Island	12,138	4,589	39.8	13,692	4,938	39.5	11,154	4,688	44.3
Nova Scotia	13,230	4,650	38.9	13,971	4,983	39.8	11,745	4,775	44.0
New Brunswick	11,172	4,291	40.8	11,869	4,470	41.0	10,099	4,194	44.5
Quebec	10,511	4,443	44.5	10,617	4,575	48.2	9,342	4,473	50.1
Ontario	14,378	6,297	45.9	15,372	6,720	46.9	13,012	6,309	50.7
Manitoba	11,173	4,538	43.0	11,707	4,732	43.9	10,245	4,651	48.1
Saskatchewan	10,450	4,258	43.8	10,720	4,469	45.9	9,562	4,390	49.7
Alberta	12,954	5,529	44.8	13,940	5,831	45.0	11,815	5,334	48.4
British Columbia	13,466	6,303	48.5	13,939	6,495	49.2	12,037	6,275	53.5
Total	12,345	4,219	43.2	13,073	5,330	44.0	11,154	5,083	48.0

Source: CMHC 1991 Core Housing Need Database, developed from the Statistics Canada Household Income, Facilities and Equipment (HIFE) and Shelter Cost Survey (SCS) microdata tape, 1991, enhanced to facilitate calculations for core housing need.

Figure 4-11

Average Incomes and Shelter Costs of Households in Core Need by Household Tenure Under Alternative Approaches, Canada, 1991

Household Tenure	30% Fixed STIR			Direct Approach (1A)			Indirect Approach (2)		
	Shelter			Shelter			Shelter		
	Income Dollars	Cost	STIR Percent	Income Dollars	Cost	STIR Percent	Income Dollars	Cost	STIR Percent
Renters	12,156	5,315	46.3	12,383	5,435	47.5	11,031	5,358	51.4
Owners With Mortgages	14,753	7,147	50.0	17,101	7,551	46.8	13,324	6,903	53.4
Owners Without Mortgages	11,548	3,157	30.5	12,133	3,269	30.8	10,278	3,048	33.3
Total	12,345	4,219	43.2	13,073	5,330	44.0	11,154	5,083	48.0

Source: CMHC 1991 Core Housing Need Database, developed from the Statistics Canada Household Income, Facilities and Equipment (HIFE) and Shelter Cost Survey (SCS) micro-data tape, 1991, enhanced to facilitate calculations for core housing need.

Figure 4-12

Average Incomes and Shelter Costs of Households in Core Need by Household Composition Under Alternative Approaches, Canada, 1991

Household Composition	30% Fixed STIR			Direct Approach (1A)			Indirect Approach (2)		
	Shelter			Shelter			Shelter		
	Income Dollars	Cost	STIR Percent	Income Dollars	Cost	STIR Percent	Income Dollars	Cost	STIR Percent
Individual	9,995	4,512	48.5	9,166	4,613	53.2	8,562	4,519	55.0
Couple	11,527	5,124	46.3	10,853	5,007	47.9	9,429	4,835	52.5
Family + Children	15,469	6,130	40.9	17,883	6,443	37.5	14,513	6,029	42.8
Single Parents	13,351	5,707	44.9	13,924	5,750	43.9	12,509	5,709	47.7
All Others	15,731	5,434	36.5	16,538	5,476	35.6	14,020	5,308	39.7
Seniors	12,277	4,549	37.8	12,116	4,646	39.7	11,165	4,582	41.8
Total	12,345	4,219	43.2	13,073	5,330	44.0	11,154	5,083	48.0

Source: CMHC 1991 Core Housing Need Database, developed from the Statistics Canada Household Income, Facilities and Equipment (HIFE) and Shelter Cost Survey (SCS) micro-data tape, 1991, enhanced to facilitate calculations for core housing need.

Figure 4-13

Average Incomes and Shelter Costs of Households in Core Need by Size of Household Under Alternative Approaches, Canada, 1991

Size of Household	30% Fixed STIR			Direct Approach (1A)			Indirect Approach (2)		
	Shelter		STIR Percent	Shelter		STIR Percent	Shelter		STIR Percent
	Income Dollars	Cost Dollars		Income Dollars	Cost Dollars		Income Dollars	Cost Dollars	
1 Person	10,559	4,432	44.1	9,562	4,461	48.7	9,262	4,467	50.2
2 Persons	12,746	5,254	43.3	12,071	5,291	45.7	10,780	5,129	49.2
3 Persons	14,220	5,915	43.8	15,555	5,968	40.8	13,231	5,918	46.9
4 Persons	15,354	6,174	41.8	16,853	6,261	38.9	13,906	5,969	44.5
5 Persons	17,436	6,211	36.5	19,880	6,698	34.6	17,049	6,275	37.4
6+ Persons	17,330	5,793	34.0	21,894	6,434	30.4	16,874	5,881	35.2
Total	12,345	4,219	43.2	13,073	5,330	44.0	11,154	5,083	48.0

Source: CMHC 1991 Core Housing Need Database, developed from the Statistics Canada Household Income, Facilities and Equipment (HIFE) and Shelter Cost Survey (SCS) micro-data tape, 1991, enhanced to facilitate calculations for core housing need.

- The average STIRs for those in need are marginally higher under the direct approach and much higher under the indirect approach. Clearly, the indirect approach identifies those in profound need from an affordability standpoint (Figure 4-10).
- Average income is higher for households of all tenures under the direct approach in comparison to the 30-percent fixed STIR (Figure 4-11). The indirect approach results in lower average incomes for households of all tenures.
- Under the direct approach, individuals in need have lower incomes than under a 30-percent fixed STIR, while families (both couples and single parents) have higher incomes and household incomes in general are higher (Figure 4-12). In contrast, all household types have lower average incomes under the indirect approach, making it the most targeted of the three approaches.
- The direct approach identifies larger households with higher average incomes in need than would be the case with the present 30-percent fixed STIR (Figure 4-13). Average household income is notably lower for all household size categories with the indirect or most targeted approach.

4.3 SUMMARY

This chapter examined the alternative estimates of housing need derived by using two different variable-STIR methods – the direct approach (Method 1A) and the indirect approach (Method 2) – and compared them with those obtained under the 30-percent fixed STIR.

Key highlights of the results include:

- The total number of households in core need identified by the direct approach (roughly 1.1 million) is only slightly below that of the current 30-percent fixed STIR (roughly 1.2 million households). Under the indirect approach, the numbers are substantially lower (about 800,000). Regardless of the approach used, however, the absolute number of households in need is still very large.
- The two alternative variable-STIR approaches make relatively little difference to the geographical distribution of need.
- Relative to the present 30-percent fixed STIR, the direct approach alters the profile of need by including a higher proportion of larger households that have somewhat higher incomes.

- The indirect approach, being more targeted to renters and the lower-income groups, can be seen as identifying those in the most profound need.
- Accountable to household needs to meet both housing and other expenditures; and
- Neutral in terms of their consideration of household organization.

4.4 CONCLUSION

Both the direct and indirect approaches meet all of the key criteria for developing a variable STIR. Specifically, they are:

- Practical;
- Empirically grounded and easily updatable from readily available information;
- Considerate of equity issues;

Nonetheless, the two alternative approaches presented here differ in the degree to which they meet the various criteria. For example, the direct approach is more sensitive to the household size criterion. On the other hand, the indirect approach better takes into account equity issues and identifies those households most in need.

A final selection of an alternative variable STIR therefore requires balancing the various criteria.

ENDNOTES

- 1 The discussion draws heavily on CMHC and U.S. Department of Housing and Urban Development, *Housing Affordability Problems and Housing Need in Canada and the United States*, February 1981, page 7.
- 2 Terry S. Lane, *What Families Spend for Housing – The Origins and Uses of the “Rules of Thumb,”* U.S. Department of Housing and Urban Development, September, 1977, page 6.
- 3 CMHC, “Terms of Reference” for this study.
- 4 CMHC and U.S. Department of *Housing and Urban Development, Housing Affordability Problems and Housing Need in Canada*, 1991, page 7.
- 5 CMHC, *Core Housing Need in Canada*, 1991, page 9.
- 6 STIRs of 100 percent or more can occur, for example, when a household has a sharp drop in income and maintains spending through using savings or obtaining financial assistance from relatives.
- 7 John Engeland, *Canadians and Their Housing Expenditures 1978-1992*, CMHC, October 1994.
- 8 Statistics Canada informs users that FAMEX data cells with estimates of 60,000 or fewer households should be treated as highly unreliable.
- 9 Note that this differs from what Statistics Canada reports in Family Expenditure in Canada 1992, February 1994, Catalogue 62-555, Table 14. The 22.6 percent reported there represents the average proportion of renters’ incomes spent on shelter in Canada. It is calculated by taking the total of all renter household shelter expenditures as a proportion of the total aggregate income of all renter households.
- 10 Marion Steele, *Canadian Housing Allowances: An Economic Analysis*, Ontario Economic Council, 1985.
- 11 Calculating the average RITPIR using the average residual income and pre-tax income numbers in Figure 2-19 (based on the average total residual income and pre-tax income of all households divided by the number of households in each size group) yields quite a different pattern – the average RITPIR is approximately 25 percent (give or take a little) across all size groups.
- 12 Note that in Section 2.12 it had been suggested that five-person and six-plus-person households be combined for subsequent analysis. However, for the specific calculations undertaken in Chapter Three, there was sufficient sample size to explore these size groups separately.
- 13 As indicated earlier, medians are used rather than averages since they are more stable and not affected by extreme values.

- 14 In developing the LIM approach, Statistics Canada carried out public consultations and examined how poverty lines were drawn in other countries. Of necessity, they still had to make some arbitrary decisions on the parameters. Nonetheless the resulting approach, which is provided in addition to the Low-Income Cut-Offs (LICOs), is less subject to "capricious shifts" caused by the expenditure data, which are the basis of the LIFCOs. Statistics Canada offers the LIMs as an alternative to the LICOs, which can be updated from income data alone and whose assumptions are more visible to the user.
- 15 Note that by using the median, the effects of extreme values at either end of the scale have been removed.
- 16 The direct approach, Method 1B (which excludes owners without mortgages), is not pursued, as the resulting STIRs were very similar to those produced by Method 2 and would therefore produce similar estimates of need.